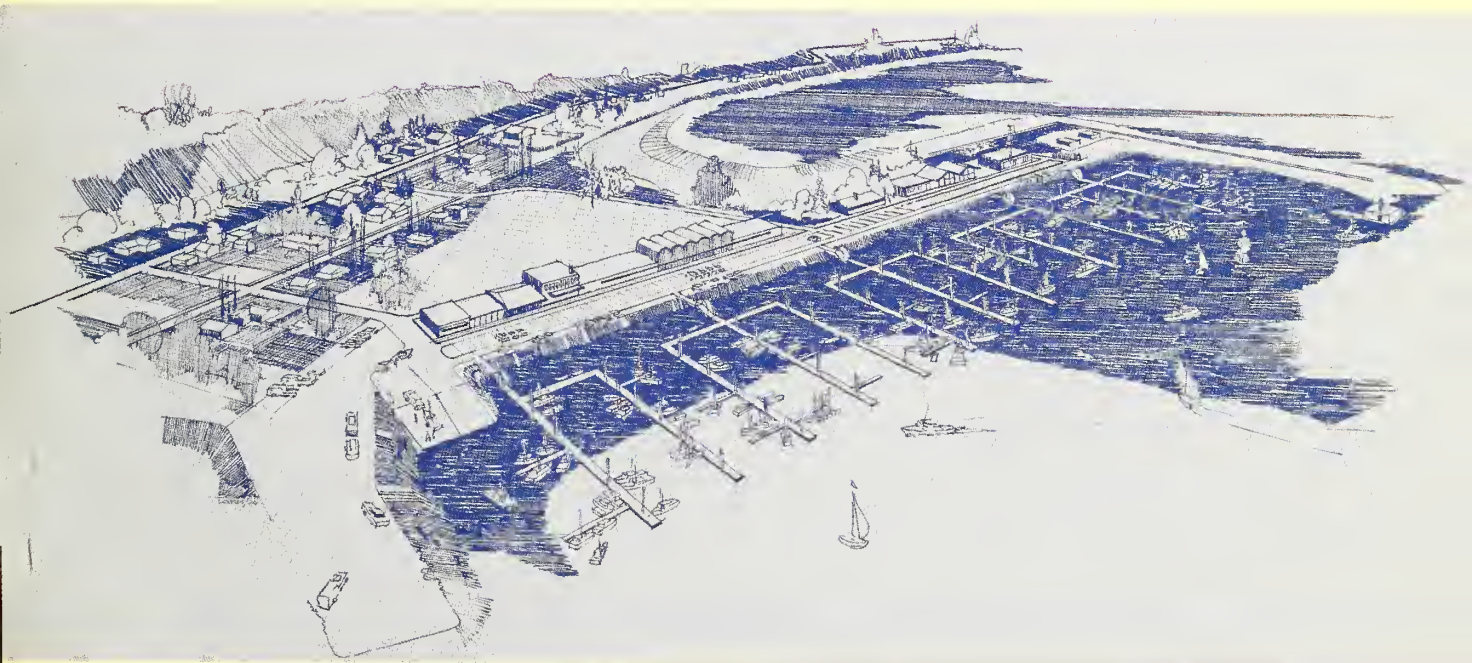



Developing  
**SMALL  
BOAT  
HARBORS**

in six  
Oregon  
Counties

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A STUDY OF THE FEASIBILITY OF DEVELOPING  
SMALL BOAT HARBORS  
IN SIX OREGON COUNTIES

by

Cornell, Howland, Hayes & Merryfield  
Engineers and Planners  
Corvallis, Oregon

for

U.S. DEPARTMENT OF COMMERCE  
John T. Connor, Secretary  
Area Redevelopment Administration  
William L. Batt, Jr., Administrator

February 1965

## FOREWORD

The basic responsibility of the Area Redevelopment Administration of the U.S. Department of Commerce is to help revitalize the economies of American communities suffering from chronic unemployment and underemployment.

One way of assisting a community is to determine the kinds and the magnitudes of its economic problems and the possible solutions. ARA helps do this through its Technical Assistance program.

This publication is a product of a technical assistance contract with the firm of Cornell, Howland, Hayes & Merryfield, Engineers and Planners, of Corvallis, Oregon.

This study determines the feasibility of developing small boat harbors and related marine facilities suitable for the requirements of commercial fishing and recreational boating activities in 15 general areas in the State of Oregon. In view of the increasing interest and activity in small boating, the conclusions and recommendations have general and broad applicability for the entire small boating industry.

William L. Batt, Jr., Administrator  
Area Redevelopment Administration



# TABLE OF CONTENTS

<u>Chapter</u>		<u>Page</u>
I	INTRODUCTION AND SUMMARY	1
	Authorization	1
	Purpose	1
	Scope	1
	Selection of Sites for Small Boat	
	Facilities in Oregon	4
	Study Areas	5
	Summary of Conclusions	6
	Sources of Capital for Improvement	
	of Facilities	11
	Indirect Benefits from Construction	
	of Small Boat Harbors	11
II	STUDY AREA 1 - LINCOLN COUNTY	13
	Location	13
	Population	13
	Boating and Fishing Resources	14
	Inventory of Facilities for Boating	
	and Fishing	15
	Use Data	19
	Probable Demand for New Boating and	
	Fishing Facilities (1965-1975)	20
	Selection of Sites for New Facilities	21
	Preliminary Site Plans	23
	Estimated Operating Revenue	
	and Expenses	24
	Indirect Benefits	30
	Conclusions	31
III	STUDY AREA 2 - CLATSOP AND COLUMBIA	
	COUNTIES	32
	Location	32
	Population	32
	Boating and Fishing Resources	32
	Inventory of Facilities for Boating	
	and Fishing	33
	Use Data	33
	Probable Demand for New Boating and	
	Fishing Facilities (1965 to 1975)	35
	Selection of Sites for New Facilities	36

# TABLE OF CONTENTS (Continued)

<u>Chapter</u>		<u>Page</u>
III	(Continued)	
	Preliminary Site Plans	38
	Estimated Operating Revenue and Expense	40
	Indirect Benefits	46
	Conclusions	47
IV	STUDY AREA 3 - HOOD RIVER, WASCO, AND SHERMAN COUNTIES	48
	Location	48
	Population	48
	Boating and Fishing Resources	49
	Inventory of Facilities for Boating and Fishing	50
	Use Data	50
	Probable Demand for New Boating and Fishing Facilities (1965 to 1975)	52
	Selection of Sites for New Facilities	52
	Preliminary Site Plans	54
	Estimated Operating Revenue and Expenses	60
	Indirect Benefits	60
	Conclusions	60

## LIST OF TABLES

Table 1	Summary of Facilities	6
Table 2	Recommended Priority for Providing Facilities for Small Boat Harbors	8
Table 3	Distances and Routes from Selected Oregon Cities to Lincoln County	14
Table 4	Existing Small Boat Facilities, Lincoln County	17
Table 5	Boat Registrations in Lincoln County - 1964	19
Table 6	Salmon and Steelhead Sport Catch for Some Lincoln County Areas	20

# TABLE OF CONTENTS (Continued)

## Page

### LIST OF TABLES (Continued)

Table 7	Estimated 1975 Revenues and Expenses from New Marina Facilities, Study Area 1 Lincoln County	30
Table 8	Existing Small Boat Facilities, Clatsop and Columbia Counties	34
Table 9	Small Boat Uses in Study Area 2	35
Table 10	Estimated Columbia River - Ocean Sport Catch of Salmon 1958 through 1962	36
Table 11	Estimated 1975 Revenues and Expenses from Proposed Marina Facilities, Study Area 2, Clatsop and Lincoln Counties	46
Table 12	Study Area 3 - Population - Counties and Cities, 1963	49
Table 13	Boating Interest	50
Table 14	Existing Small Boat Facilities, Hood River, Wasco, and Sherman Counties	51
Table 15	Columbia River Salmon and Steelhead Sport Catch for the Years 1955-1959 in Waters Adjacent to Hood River, Sherman, and Wasco Counties	52
Table 16	Present and Estimated Facilities	53
Table 17	Estimated 1975 Revenues and Expenses from New Marina Facilities, Study Area 3, Hood River, Wasco, and Sherman Counties	60

# TABLE OF CONTENTS (Continued)

## Page

### LIST OF FIGURES

#### INTRODUCTION AND SUMMARY

Figure 1	Population and Pleasure Boat Registration Forecast, State of Oregon (1960 to 1980)	3
----------	--	---

#### STUDY AREA 1 - LINCOLN COUNTY

Figure 1-1	Alsea Bay - Waldport	25
Figure 1-2	Yaquina Bay - Newport	26
Figure 1-3	Yaquina River - Toledo	27
Figure 1-4	Depoe Bay	28
Figure 1-5	Siletz Bay - Taft	29

#### STUDY AREA 2 - CLATSOP AND COLUMBIA COUNTIES

Figure 2-1	Seaside	41
Figure 2-2	Warrenton	42
Figure 2-3	Astoria	43
Figure 2-4	Rainier	44
Figure 2-5	St. Helens	45

#### STUDY AREA 3 - HOOD RIVER, WASCO, AND SHERMAN COUNTIES

Figure 3-1	Cascade Locks	56
Figure 3-2	Hood River	57
Figure 3-3	The Dalles	58
Figure 3-4	Mouth of the Deschutes	59

## TABLE OF CONTENTS (Continued)

### LIST OF APPENDIXES

#### APPENDIX I - MAPS AND CHARTS

Plate I-1	State of Oregon - County and General Areas
Plate I-2	Crab, Salmon, and Tuna Fisheries in Vicinity of Oregon Coast
Plate I-3	Operating Areas and Catch of Oregon and Adjacent Fishing Fleets

#### APPENDIX II - EXISTING BOAT FACILITIES

Plate II-1	Lincoln County - Alsea Area
Plate II-2	Lincoln County - Newport and Toledo Area
Plate II-3	Lincoln County - Depoe Bay Area
Plate II-4	Lincoln County - Siletz Area
Plate II-5	Clatsop County - Seaside Area
Plate II-6	Clatsop County - Warrenton, Astoria Area
Plate II-7	Columbia County - Rainier Area
Plate II-8	Columbia County - St. Helens Area
Plate II-9	Hood River County - Cascade Lock Area
Plate II-10	Hood River County - Hood River Area
Plate II-11	Wasco County - The Dalles Area
Plate II-12	Sherman County - Deschutes Area

#### APPENDIX III - FLOAT DESIGN

Plate III-1	Proposed Typical Float Design
-------------	-------------------------------

## TABLE OF CONTENTS (Continued)

### APPENDIX IV - FORECASTS

Table IV -1	Population and Pleasure Boat Registration Oregon Counties (1965 to 1980)
-------------	---

### APPENDIX V - COST ESTIMATES OF PROPOSED FACILITIES

Table V-1	Alsea Bay - Waldport
Table V-2	Yaquina Bay - Newport
Table V-3	Toledo - Yaquina River
Table V-4	Depoe Bay
Table V-5	Siletz Bay - Taft
Table V-6	Seaside
Table V-7	Warrenton
Table V-8	Astoria
Table V-9	Rainier
Table V-10	St. Helens
Table V-11	Cascade Locks
Table V-12	Hood River
Table V-13	The Dalles
Table V-14	Deschutes River Mouth



## CHAPTER I

### INTRODUCTION AND SUMMARY

#### AUTHORIZATION

This study was conducted under the provisions of Contract No. Cc 6115 with the U. S. Department of Commerce, Area Redevelopment Administration, Washington, D. C., dated 15 January 1964. Mr. George F. Merlino is the Contracting Officer.

#### PURPOSE

The purpose of the study is to determine the feasibility of developing small boat harbors and related marine facilities suitable for the requirements of commercial fishing and recreational boating activities in 15 general areas in 6 ARA designated counties within the State of Oregon. The ARA is also interested in the employment opportunities that can be created for local residents through construction and operation of such facilities.

#### SCOPE

The study includes, for each of the general areas, an inventory of existing small boat facilities, a survey of the resources and attractions for commercial use and recreational boating, an estimate of the probable future requirements for small boat facilities, a preliminary layout for development of facilities in accordance with the predicted demand, an economic analysis of probable income and expense, and a brief discussion of the possible effect of construction of the proposed new facilities on employment in the area.

The study also includes a typical design for float structures which may be used at all locations. The scope does not include soil borings or other detailed site property or engineering investigations, nor does it include comparison of alternate sites in the same general area. Construction at any of the locations will require further field work and the preparation of construction plans and specifications.

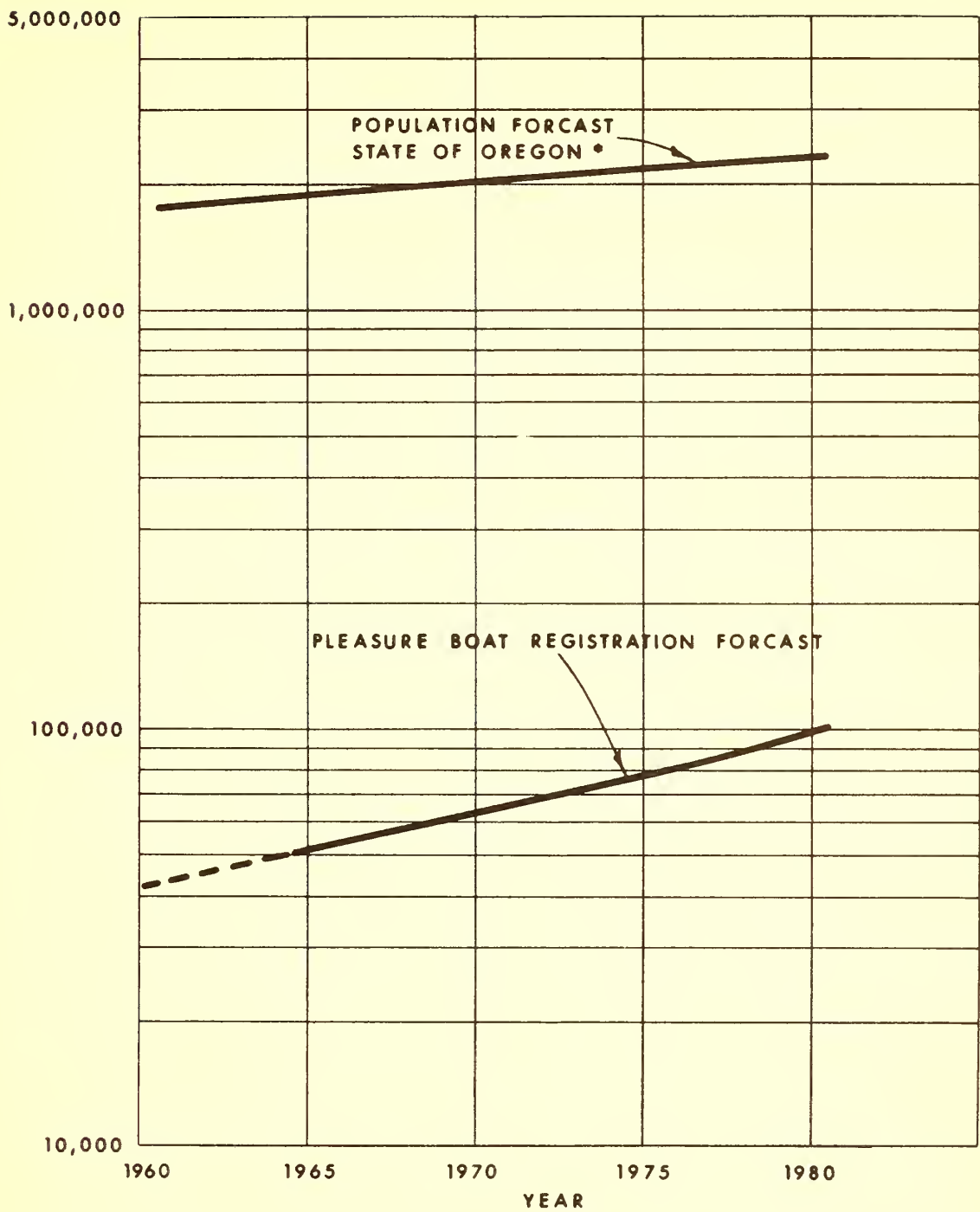
## Recreational Boating and Commercial Fishing in Oregon.

General. Recreational boating and commercial fishing both bring into use several of the same State resources. Although the coastal streams of Oregon, except for the Columbia River, are closed to commercial fishing, the offshore banks provide both sport and commercial fisheries, and the same species are sought in both pursuits. Oregon's fishing vessels are generally small craft (under 5 net tons) requiring the same degree of protection from storm conditions, the same depths and width of channels for navigation, and generally the same type of shore facilities for support as do the pleasure craft.

Recreational Boating. There were 45,638 pleasure boats registered with the State Marine Board on 1 January 1962. This is approximately double the number which were registered in 1957. It is estimated that 50,000 small boats will be registered in 1964 and that there will be an average of one boat for every 36 persons in the Oregon population today (50,000 boats for 1,816,000 population). Projections as shown on Figure 1 indicate that the number of boats in Oregon will again double by the year 1980. At that time, the ratio of boats to population is expected to average one boat to every 23 people. A recent survey indicates that fishing is the principal recreational activity of small boat owners and that cruising and sightseeing constitute the chief activity of the owners of large boats (21 feet in length and over).

The Oregon State Game Commission reports that the number of licensed hunters and anglers in the state increased by over 50 percent in the years from 1949 to 1959 and predicts that the number will reach 1,000,000 by 1970. The State Game Commission also estimates that hunters and anglers now spend \$60,000,000 yearly in following their avocation and that the amount spent will exceed \$100,000,000 in 1972.

Commercial Fishing. Although for 1963 a total of 3,000 licensed commercial fishermen and 1,469 commercial fishing boats were registered with the Oregon State Marine Board, Oregon's commercial fishery is relatively small when measured in dollars or tons of fish. Oregon's share of the nation's fishing in 1962 was 1.1 percent of total volume and 1.7 percent of the total value. The State Fish Commission reports that the industry is declining and that no increase is contemplated until a market for less utilized species is developed.



\* OREGON STATE BOARD ON CENSUS BULLETIN P-10

FIGURE 1  
POPULATION AND PLEASURE BOAT REGISTRATION FORECAST  
STATE OF OREGON ( 1960 TO 1980 )

Inshore, the salmon is the major species taken commercially and includes the Chinook, Blueback or Sockeye, Silver, and Chum varieties. Offshore, the flounder, ocean perch, rockfish, and sole are important. Albacore tuna, which in 1944 provided 22-1/2 million pounds, have almost disappeared from the Oregon coastal waters. Secondary species, as far as Oregon landings are concerned, are halibut, ling cod, sablefish, steelhead, shad, smelt, and sturgeon.

## SELECTION OF SITES FOR SMALL BOAT FACILITIES IN OREGON

Criteria for judging sites for the location of small boat facilities in Oregon may reasonably be based on the primary incentive for boating which is now and probably will continue to be fishing. Thus, the prime consideration for location is proximity to the ocean.

After proximity to the ocean, the other features considered desirable for location are listed and discussed in the paragraphs which follow:

Access. Location should be adjacent to or visible from a main highway. A well laid out and busy marina has great ability to draw tourists and vacationers in addition to those who are boat owners or users. Restaurants, shops, and motels adjacent to or overlooking such facilities are given an extraordinary appeal, and people will drive miles out of their way to patronize them. Other indirect benefits flow to the resort community from this appeal.

Land Ownership. Since the construction of a modern marina is an undertaking too large in scope for most private businesses, the task may well fall upon a port district, city, or county to provide the land and initiate the project. If publicly owned land is available for use, beginning of the project will be easier.

Protected Entrance Channel. In addition to proximity to the ocean, means must be provided to assure a safe passage from the moorage area through the breakers to open sea. The channel must be deep enough to prevent ocean waves from breaking in the entrance. In most cases, a jetty is also required to stabilize the entrance, prevent shoaling, and provide wave energy dissipation.

## STUDY AREAS

The six counties and fifteen general locations which fall within the scope of this study have been grouped into three general geographic areas as shown on Plate I - 1 of Appendix I. The decision to deal with the fifteen sites on a county and county-group basis was taken for the following reasons:

1. Statistics on boat registrations and use are available on a county basis and are not now available in further detailed breakdown.

2. The construction cost of a modern marina is generally above the financial capabilities of most private businesses and of the small towns in which the sites to be studied are located. Most Oregon marinas have been constructed with major county or port district (and often Federal) participation.

3. In any of the locations studied, the establishment of a boat harbor large enough to be feasible from an operating standpoint will have an effect on all boating installations in the county. Older and less desirable facilities may suffer a loss of customers and revenue. Others may benefit from the general increase in boating traffic brought about by interest generated by the new facility.

Lincoln County is not contiguous with any of the other five counties, and its group of five sites is designated as Study Area 1. Clatsop and Columbia Counties, which have a common boundary with four sites oriented toward the Columbia River and its estuary, and one site with direct access to the Pacific Ocean, are designated as Study Area 2. Hood River, Wasco, and Sherman Counties are contiguous and form Study Area 3, well separated from the other 2 areas. Sites (general areas) to be studied within each group are listed as follows:

<u>Study Area</u>	<u>Counties</u>	<u>Sites</u>
1	Lincoln	Alsea Bay - Waldport Yaquina Bay - Newport Yaquina River - Toledo Depoe Bay Siletz Bay - Taft
2	Clatsop and Columbia	Astoria (2) Rainier St. Helens Seaside Warrenton



<u>Study Area</u>	<u>Counties</u>	<u>Sites</u>
3	Hood River, Wasco, and Sherman	Cascade Locks Deschutes (mouth) Hood River The Dalles

## SUMMARY OF CONCLUSIONS

1. The probable increase in population, the growth of interest in recreational boating, and the natural deterioration and obsolescence of waterfront structures which occurs with age, may require, during the period 1965-1975, new small boat facilities in the six counties studied in the amounts listed below:

TABLE 1

### SUMMARY OF FACILITIES

<u>Counties</u>	<u>Wet Slips, No.</u>	<u>Launching Ramps (Lanes)</u>
Lincoln	394	28
Clatsop and Columbia	900	40
Hood River, Wasco, & Sherman	<u>193</u>	<u>18</u>
TOTAL	<u>1,487</u>	<u>86</u>

2. The requirements for facilities for the commercial fishing fleet are not expected to increase within the foreseeable future. Development of a market for the fish species which are not now utilized could change this situation; the construction of additional harbors or facilities will not do so. Continuing requirements of the present commercial fishing fleet are included in the figures given in the previous paragraph.

3. Establishment of a chain of small boat harbors on the Oregon coast and up the Columbia River would provide safety and interesting and attractive destinations for small boat cruising. Completion of the facilities proposed in this study will not complete such a chain, but will noticeably improve the situation.



4. The established trend among boat owners is to patronize the modern marina type facility where complete service for the boat is provided and the needs of the passengers may be satisfied. In addition to boat moorages, the modern marina provides water, electricity, fueling facilities, launching hoists and ramps, sales and repair, supplies, bait and tackle shops. For the boater's personal needs, rest rooms and food service facilities are essential and locker and showers, lounge, and picnic area desirable. Above all, ample and convenient parking for automobile and trailers is required. Table 2 shows a recommended priority for providing such facilities in the Oregon counties studied.

5. The cost of construction of the marinas necessary to meet the demand for small boat facilities in 1975, in the counties under study, is listed below:

<u>Counties</u>	<u>Estimated Cost</u>
Lincoln	\$2,450,000
Clatsop and Columbia	6,778,000
Hood River, Wasco, & Sherman	<u>1,020,000</u>
 TOTAL	 <u>\$10,248,000</u>

These estimated costs include construction of the harbor protection where necessary, basin, piers, boat ramps, and land fill for parking, administrative and commercial areas, plus utilities and administration and rest room structures. Other structures for sales, repair, supplies, restaurants, etc., as is customary, would be provided by concessionaires on a lease and income-sharing basis.

6. Based on the schedules of charges now in effect at existing private and public moorages, the income from operation of the proposed small boat facilities might average \$175,000 per year. Capital costs on the basis of 50-year amortization and interest at 3 percent would be \$393,000 per year. Operating expenses and maintenance could be \$137,000. The operating deficit, \$355,000 per year, must therefore be offset by indirect benefits.

7. Indirect benefits from the construction and operation of these facilities are estimated as follows:

Construction employment (one time)	105,000 man-days
Maintenance employment	920 man-days/year
Operating personnel (continuing)	4,500 man-days/year

Some increased benefits from tourist patronage will also accrue.

TABLE 2

RECOMMENDED PRIORITY FOR PROVIDING FACILITIES  
FOR SMALL BOAT HARBORS

Relative Priority	Facility	Installation
		Owner (O) Concession (C)
1	Launch Ramp	O
2	Car and Trailer Parking	O
3	Wet-Slip Mooring	O
4	Rest Rooms	O
5	Harbormaster Office	O
6	Food Service	C
7	Water	O
8	Fuel	C
9	Electric Power	O
10	Charter Service (where applicable)	C
11	Boat, Motor Repair	C
12	Bait, Tackle, Supply Sales	C
13	Boat Hoist	O
14	Dry Boat Storage	C
15	Boat, Motor Sales and Rental	C
16	Fish Processing (where applicable)	C

8. With the cost of new facilities so large and the proportion of direct to indirect benefits so small, it is apparent that in most cases public sponsorship and financing may be necessary for construction. Private enterprise should be encouraged to provide support facilities on a lease and income sharing basis.

9. Public construction and operation of modern and attractive marinas will cause some dislocation of customers and loss of income to existing private facilities. The rate schedule at the new public facilities should be designed to minimize the effect of such competition.

10. Some locations, because of existing improvements and natural advantages, are much more economical to develop than others. At the same time, the boating resources and the demand for facilities at some of the more expensive locations may be so superior as to offset the higher development costs. The condition and extent of present facilities and their deficiencies in relation to forecast demand constitute a third factor which enters into the establishment of relative priorities for development. The list which follows is a recommended priority for development within the general areas and is based on an estimation of the combined weight of all three factors of judgment.

Recommended General Priority for Develop- ment of Small Boat Har- bors and Related Marine Facilities	Boating Resources and De- mand (Fishing, Cruising, Boat Owners in Area, Attrac- tive Site)	Deficiency of Present Fa- cilities in Relation to De- mand	Construction Cost	Relative Total Priority
--	---	--	-------------------	-------------------------

AREA I - Lincoln County

Yaquina Bay	1	3	1	1
Alsea Bay	3	2	2	2
Depoe Bay	2	1	5	3
Siletz Bay	4	4	4	4
Toledo	5	5	3	5

AREA II- Clatsop & Columbia Counties

Warrenton	1	3	1	1
Astoria	2	*2	2	2
Seaside	3	1	**5	3
St. Helens	4	4	3	4
Rainier	5	5	4	5

AREA III - Hood River, Wasco & Sherman Counties

Cascade Locks	1	2	1	1
Deschutes	3	1	2	2
Hood River	2	3	3	3
The Dalles	4	4	4	4

\* The Port of Astoria now has two small boat harbors and is studying the consolidation of facilities into one marina. This report reviews a proposal to develop the Astoria Basin as a marina to accommodate all needs of the general area.

\*\* Seaside has no harbor and no small boat experience to justify a project. The costs, principally for harbor protective works, are not within the same region of feasibility as the other general areas.

## SOURCES OF CAPITAL FOR IMPROVEMENT OF FACILITIES

There are three and sometimes four sources of funds to finance capital improvements in small boat harbors and related marine facilities in Oregon. These are:

1. County or Port District general obligation bond issues.
2. State Marine Board disbursement from boat registration fees to counties.
3. State gasoline taxes not refunded to boat owners.
4. Federal matching funds - Rivers and Harbors Act, etc.

The State Marine Board disbursements from boat registration fees to the counties are based on the number of boats registered in each county. On this basis, the six counties received some \$22,000 for a 10-month period ending in October 1963. Disbursement on a "county-of-use" basis would give a much larger share, perhaps as much as \$47,000 per year, to the six counties.

The State gasoline taxes not refunded to boat owners are used by the State Highway Department. A proposal to direct these monies to the State Marine Board was recently placed before the Legislature. On a "county-of-use" basis as above, the six counties' share might be as much as \$55,000 per year, bringing the total income from registrations and gasoline tax to \$102,000 per year.

This combined income of \$102,000, if capitalized on a 50-year, three percent basis, would have a present value of approximately \$2,630,000.

## INDIRECT BENEFITS FROM CONSTRUCTION OF SMALL BOAT HARBORS

Construction of small boat harbors will allow the six counties to accommodate the predicted increase in number of boats (3,310) during the 1965-1975 period. It is possible, using certain broad assumptions, to estimate the amount of the relative increase in income to the six counties from the 3,310 additional boats. Assume that the average small boat crew contains three persons, and that each member spends \$2.50 per day for gasoline (less tax), food, bait, tackle, and other services and supplies. Further assume a

net profit of 10 percent on these purchases and the total annual benefit as represented by the net income becomes \$111,400. Capitalized on a 50-year, three percent basis, the present value of this increase in boats and boating is \$2,860,000.

Adding the \$2,630,000 from possible State sources to the \$2,860,000 benefit to local business makes a total of \$5,490,000 which could conceivably be justified on a county or county group basis. Further justifications probably exist, but will need to be assessed on a broader state or regional basis, which is beyond the scope of this study.



## CHAPTER II

### STUDY AREA 1 - LINCOLN COUNTY

#### LOCATION

Lincoln County, on the Pacific Ocean, includes the central part of Oregon's Coast Range Mountains, 165 miles north of the California border and 90 miles south of the Columbia River. County land area is 985 square miles, covered almost entirely by commercial forest of hemlock, spruce, and Douglas fir timber. Its sixty miles of coast line is noted for rugged scenic beauty. Three large rivers draining the western slope of the Coast Range flow in a westerly direction through Lincoln County and discharge through bays and estuaries into the Pacific. These are the Siletz River in the north, the Yaquina River near the center, and the Alsea River in the south. Depoe Bay is a small natural rock-ribbed harbor on the coast between the mouths of the Yaquina and Siletz Rivers. The location of Lincoln County and adjacent areas is shown on Plate I-1 of Appendix I.

#### POPULATION

Lincoln County's population in 1963 was estimated to be 22,500 people. The three largest cities are Newport, with a population of 5,344; Toledo, with 3,053; and Oceanlake, with 1,341. Waldport and Taft have 667 and 557 people, respectively. The Port of Newport District includes Yaquina Bay and the lower Yaquina River, Depoe Bay, Siletz Bay, and the lower Siletz River; the Port of Toledo includes the upper Yaquina and Siletz Rivers; and the Port of Alsea includes Alsea Bay and the Alsea River.

The Willamette Valley with its major population centers lies just inland and to the east of Lincoln County. Routes and distances from these centers to the Lincoln County boundary are shown in Table 3.

TABLE 3

DISTANCES AND ROUTES FROM SELECTED OREGON CITIES  
TO LINCOLN COUNTY

<u>City</u>	<u>Population</u>	<u>Highway Route No.</u>	<u>Distance</u>
Portland	377,957	Oregon 18	78 miles
Salem	50,759	Oregon 18	39 miles
Albany	14,544	U.S. 20	33 miles
Corvallis	26,440	U.S. 20	22 miles
Eugene-Springfield	79,874	Oregon 34	61 miles

U.S. Highway 101, the scenic route along the coast, connects Lincoln County's major cities with each other and with California and Washington cities. It is one of the principal tourist arteries and attractions in the west. There are 22 parks, monuments, beaches, and waysides in Lincoln County.

Airports are located near Newport, Toledo, and Wecoma Beach. The Newport field has 5,000-foot runways and some navigation equipment. The other two fields are suitable for light aircraft only.

### BOATING AND FISHING RESOURCES

Lincoln County has much to offer the fisherman, but at present very little to encourage the boat owner who is interested in cruising, sightseeing, or other boating pleasures.

The principal attraction for the fisherman-boater is, of course, the chance for success in catching fish, while the principal desires of the cruising and sightseeing boater are a chain of sheltered harbors which will provide:

1. Interesting destinations
2. Safety from storms
3. Overnight camping and picnicking facilities
4. Sunny mild weather

Ocean Fishing. Ocean fishing is greatly influenced by the presence of plankton and other nutrients which have their greatest concentration in the colder and deeper currents. When the surface flow is forced in-shore by obstructions, the deeper current upwells, as in a vertical eddy, and brings to the surface the richer stores of fish food. There are three such upwellings off the Oregon coast; one at the Rogue River mouth, a second at Coos Bay, and a third extending southwesterly off the Lincoln County coast for about 40 miles from Newport.

Ocean fishing from small boats is possible at Newport and Depoe Bay where entrances provide sufficient draft and protection from breakers. Boaters have used Alsea Bay and Siletz Bay entrances; however, this is considered extremely dangerous because of shoaling, sudden squalls, and rough seas. Depoe Bay, a natural harbor protected by rocky headlands on both sides, has the best access to the ocean of any on the coast. A boater may launch from this location and be at the ocean fishing grounds in a few minutes. Likewise, he can find ready shelter when storm conditions threaten.

River and Bay Fishing. River and bay fishing from small boats is possible on the Alsea, Yaquina, and Siletz Rivers, but not on Depoe Bay because of its limited area. The Alsea and Siletz Rivers are noted steelhead and salmon streams. All Oregon coastal rivers are closed to commercial fishing.

Water Skiing and Other Boating Sports. Because of cool winds, relatively low water temperatures, and lack of facilities, water skiing has not been popular in Lincoln County. In the lower bays, the frequent cold winds from the ocean are discouraging. Where the temperatures are more pleasant in the upper sections of the rivers, the waterways are narrow and there are no swimming beaches or floats from which water skiers could be launched.

## INVENTORY OF FACILITIES FOR BOATING AND FISHING

There are now some 44 establishments directly supporting the boating and fishing industry in Lincoln County. Seventeen, or 39 percent, are on Yaquina Bay and River, and the remainder are almost equally distributed on Depoe Bay, Alsea Bay and River, and Siletz Bay and River.

The most modern and fully developed marina in the County provides the following listed accomodations:

Launching ramp	1 lane
Boat hoist	6-ton
Fueling station	
Wet slips	100 boats
Dry storage, covered	30 boats plus
Boat and motor sales	
Boat and motor repair	
Fresh water	2 outlets
Electric power	50 outlets
Bait and tackle shop	
Parking	150 cars
Trailer park	8 acres (under construction)
Rest rooms	2

Customer demand is increasing and further expansion is planned by the owners.

Most existing establishments provide fueling, wet slips, water, electric power, bait and tackle, and rest rooms. The minimum facility provides only a launch ramp and a minimum automobile parking area. Most small boat facilities in the County are neither as complete nor as well maintained as the example cited in the previous paragraph. For these and other reasons, their return from income is marginal at best.

Table 4 gives a listing of the existing small boat facilities in Lincoln County, broken down by general location and river miles, and showing the accommodations available at each moorage.

There are 37 installations providing boat slips of all sizes in the County. The average facility has 41 slips. Some of these slips provide no more than space abreast of several small boats. Other slips are complete with finger piers plus water and individual electric service for each slip.

The only yacht or boat club in the county is the Yaquina Boat Club of Toledo. This club has some 14 members but no club house or marina facilities.

TABLE 4

## EXISTING SMALL BOAT FACILITIES LINCOLN COUNTY

1 OF 2

MOORAGE NAME		PUBLIC OWNED	LOCATION RIVER - MILE	RAMP (LANES)	HOIST	FUEL	WET SLIPS	DRY STORAGE	SALES	REPAIR	WATER	ELECTRIC	BAIT. TACKLE	FISH PROCESS.	PARKING	REST RMS.	RESTAURANT	CHARTER	RENTALS
YAQUINA BAY & RIVER																			
1	DEEP SIX MARINA		1.3 L		X	X	75			X	X					X	X		
2	TAYLOR'S SEA TROLLERS		1.4 L				2											X	
3	OLSON'S		1.5 L				20 <sup>C</sup>						X						X
4	ABBNEY BOAT MOORAGE		1.5 L				20 <sup>L</sup>				X		X						X
5	RICH'S TRADE WINOS		1.5 L										X					X	
6	NEPTUNES MOORAGE		1.6 L			X	43				X		(P)			X	(P)		
7	SEAGULL LANDING		1.6 L		X	X	45		X	X	X		X			X		X	
8	PORT OF NEWPORT	X	1.7 L			X	205			X	X								
9	MOORES		2.0 L	3		X	60				X		X			X			
10	SAWYERS' LAUNCHING		4.3 L		X	X	35				X		X			X		X	
11	YAQUINA MARINA		4.5 L		(P)	X	40			X	X		X			X	X		X
12	GILONERS' MARINE WAYS		4.7 L		X					X									
13	RIVER BEND MARINA		5.3 L	(1)	X	X	100	X	CX	X	X	50%	X		158	X	(P)		
14	CRITESER MOORAGE		10.7 L		X		56			X						X			
15	JACKS' SPORT DOCK (P-14)		11.1 L	1Y		X	25		X	X			X		X	X		X	X
16	TOLEDO LAUNCHING AREA	X	11.1 R	1											X				
17	FRED'S SPORT SHOP		13.0 R		X	X	15				X		X			X			
							741												
ALSEA BAY & RIVER																			
1	WALOPOORT DOCKS	X	1.7 R	(1Y)		(X)	(50)				(X)	(X)	(X)			(X)	5		(X)
2	CURTIS MOORAGE		5.1 R	(1Y)		X	25				X	X	X			X			X
3	ORIFT CREEK		5.2 R	1		X	50			X	X	X	X			X	5		X
4	MCCOMBS		5.2 R		(1Y)		12				X	X				X			
5	OAKLANOS		5.5 R	1		X	95			X	X	X	X			X	5		X
6	DEANS		8.3 L	1		X	26				X	X	X			X	5		
7	TAYLORS		8.4 L		1	X	60				X	X	X			X	5		
8	KOZY KOVE		11.0 L	1	(1Y)	X	26				X	X	X						

344

P = PLANNED      O = OPEN      C = COVERED      Y = MAJOR REPAIRS REQUIRED  
 R = RIGHT SIDE RIVER      L = LEFT SIDE RIVER  
 ( ) = WALOPOORT MOORAGES DESTROYED BY TSUNAMI WAVE, MARCH 27, 1964.

TABLE 4

## EXISTING SMALL BOAT FACILITIES LINCOLN COUNTY

2 OF 2

MOORAGE NAME	PUBLIC OWNED	LOCATION RIVER - MILE	RAMP (LANES)	HOIST	FUEL	WET SLIPS	DRY STORAGE	SALES	REPAIR	WATER	ELECTRIC	BAIT. TACKLE	FISH PROCESS.	PARKING	REST RMS.	RESTAURANT	CHARTER	RENTALS
DEPOE BAY																		
1 PDRT DF NEWPORT DOCKS						180					X			X	X		X	X
2 DEPOE BAY MARINA					X	4	D		X	X	X	X			X		X	X
3 CALKINS						4				X	X						X	
4 JIMCO						18				X	X		X		X			
5 DEPOE BAY FISH CD.						2												
8 U. S. COAST GUARD					X	4		X		X	X			X	X		X	
7 SEA TROLLERS						7				X	X						X	
8 TRADEWINDS					X					X	X							
9 TEXACO														X				
10 DREGDN ST. FISH CDMM.	X		2			227												
SILETZ RIVER																		
1 BAILEY'S DOCKS, TAFT		0.2 L		X							X	X	X					X
2 SILETZ MOORAGE, KERNVILLE		2.1 L	1		X	68	C				X	X		X	X	X		X
3 CHINDOK HARBOR, KERNVILLE		2.1 L	1		X	16					X	X			X			X
4 SILVER LANDING, KERNVILLE		2.2 L			X	10					X	X			X			X
5 RIVERSIDE BOATHOUSE, KERNVILLE		2.4 L		(1)	X	30					X	X	X		X			X
6 CODYTE ROCK		4.0 L	1		X	32					X	X	X		X			X
7 WICK'S PLACE		5.5 L		X	X	40					X	X	X		X			X
8 SUNSET LANDING		6.5 L		X	X	50			X		X	X	X		X			X
9 MACK'S LANDING		10.0 L	1		X	12				X	X	X						X
						258												
TOTAL LINCOLN COUNTY						1569	-50							1	6	28	8	10
45 MOORINGS				11	9	27	37	3	4	12	32	23	23					19

P = PLANNED    D = OPEN    C = COVERED    Y = MAJOR REPAIRS REQUIRED  
 R = RIGHT SIDE RIVER    L = LEFT SIDE RIVER



## USE DATA

Boat registrations. Table 5 shows data extrapolated from results of a sampling survey by the Oregon State Marine Board, supplemented by records of the U.S. Customs Service.

TABLE 5

### BOAT REGISTRATIONS IN LINCOLN COUNTY - 1964

		<u>Percent</u>
Pleasure	841	71
Livery	185	15
Manufacturer	1	
Commercial Fishing	142	12
Commercial Passenger	6	
Tug	14	1
Other	<u>10</u>	<u>1</u>
Total	1,189	100

Lincoln County ranks fourth among 36 Oregon counties in number of boats under 21 feet, and fifth in boats over 21 feet. It has approximately seven percent of total State use boats under 21 feet and six and one-half percent of total number of boats over 21 feet.

Lincoln County has approximately 10 percent of the 1,469 commercial fishing boats registered with the Oregon State Marine Board and the U.S. Customs Service.

Sports Fishing. This is the preferred form of recreation for most Lincoln County boat users. Whenever the weather and sea are favorable, the sports fishermen will cross the bar to fish the banks offshore. The bay entrances suitable for this purpose are limited to those at Depoe Bay and Newport.

Depoe Bay. During the season from 15 June to 30 September 1963, fishing boats made 8,972 bar crossings at Depoe Bay. The anglers were about equally divided between private pleasure craft and charter boats with 19,200 persons and 19,700 persons of each type, respectively. Thirty-five thousand six hundred fish were caught which, at an average of 0.91 fish per angler, is considered to be good success. Comparison with the longer Yaquina Bay record shows 1963 to be a good, though not an outstanding year.

Yaquina Bay. The record of 14,259 bar crossings for Yaquina Bay in 1963 is over one and one-half times that at Depoe Bay; however, only 30,346 fish were caught by the 41,798 anglers setting out from Yaquina Bay for an average of 0.72 fish per angler.

River Sport Fishing. River sports fishing produced some 30,879 fish in 1961. The distribution, as shown in Table 6, indicates that the Yaquina River produced almost half of the total catch. This does not indicate that the fishing resources of the Yaquina are superior. Rather, it does indicate that most of the boating fishermen prefer to launch at a port where they have a chance of access to ocean fishing. They will fish the river if prevented from crossing the bar.

TABLE 6  
SALMON AND STEELHEAD SPORT CATCH FOR  
SOME LINCOLN COUNTY AREAS\*

<u>Year</u>		<u>Alsea River and Bay</u>	<u>Siletz River and Bay</u>	<u>Yachats River</u>	<u>Yaquina River</u>
1961	Salmon	5,531	3,666	124	14,656
	Steelhead	3,578	3,051	89	397

----

\* Oregon State Game Commission

Commercial Fishing. The Newport area, as designated by the Pacific Marine Fisheries Commission, includes all of the Lincoln County offshore areas and extends from Winchester Bay on the south to Tillamook on the north. The 1962 catch in this area was 7,093,000 pounds which was approximately 45 percent as large as the catch landed at Astoria. Approximately one-twelfth to one-third of the Newport area catch is landed at Depoe Bay. See Plate I-3 of Appendix I.

#### PROBABLE DEMAND FOR NEW BOATING AND FISHING FACILITIES (1965-1975)

There are two major reasons why additional boating facilities will be required in Lincoln County during the period 1965 to 1975. First, there will be a general increase in population, in the ratio of boat

owners to population, and in recreational demands of the boat-owner segment of the population. The second circumstance requiring additional boating facilities in Lincoln County is that many of the existing facilities are now obsolete or poorly located and will reach the end of their useful life through normal deterioration prior to 1975.

Estimates show that a total of 1,399 moorage spaces for small boats will be required in 1975. Although there are now approximately 1,480 mooring spaces existing in the County, the demand for spaces in favored moorages is actually so great that waiting periods of four to six months before receiving assignment are fairly common.

On the basis that the number of boat owners using Lincoln County moorages will increase from 907 in 1965 to 1,399 in 1975, and that up to one-half of the existing older facilities will become obsolete or fully depreciated during that time, the total number of new spaces required will be 413.

It is quite probable that the demand for additional spaces at Depoe Bay would not be satisfied if all the new spaces were to be placed there; however, waterfront land there is extremely limited by surrounding hills and new construction is correspondingly expensive. It would therefore be best for the County if new construction were to be distributed so as to benefit other areas where expansion is possible.

### SELECTION OF SITES FOR NEW FACILITIES

Complete boating facilities are now provided only at Depoe Bay. New or expanded facilities may be located in the general areas listed below. These sites have been selected and rated in relative order of priority in consideration of the criteria mentioned previously.

Alsea Bay, Waldport. Although Alsea Bay is in many respects similar to Yaquina Bay, it has neither a deep channel nor a protective jetty and, therefore, access to the ocean is now unavailable. This is unfortunate because Alsea Bay entrance is 8 to 10 miles closer to the prime fishing grounds than is Newport, and river fishing here is superior.

The site selected is on State Highway 34 near the intersection with U.S. Highway 101. It is visible from the bridge across Alsea Bay and provides a beautiful setting for a marina against a dark backdrop of

timbered hills. The Port of Alsea owns most of the property which would be required for development. The town of Waldport with its restaurants and shopping facilities is also adjacent and would support and be supported by the proposed marina.

The Port's small boat facilities (approximately 50 slips) and floats were swept away in the tsunami of 27 March 1964. Prior to this loss, almost one-fourth of Lincoln County's small boat moorages were located on the Alsea Bay and River.

Yaquina Bay, Newport. This site is only one and one-half miles from the river mouth and is well sheltered from wave action and surge. The Yaquina Bay entrance channel is protected and stabilized by rock jetties and will accommodate not only small craft but ocean vessels of up to 30 feet in draft. The site selected is on property owned by the Port of Newport and has ample land and water area for future development and expansion. The site is adjacent to and easily visible from the bridge which carries U.S. Highway 101 across Yaquina Bay. This is in an area where demand for launching and mooring facilities can not be met by existing facilities.

Yaquina River, Toledo. Toledo, being 11 miles up the Yaquina River, is strictly a river moorage situation. It does provide a fine protected winter anchorage and would possibly be used by local residents and fishermen from Newport during the off season. It is not particularly suitable as a base for recreational boating, and, being off the main highway, it does not constitute an attraction for tourists. The development of a park and campground facility here would make this an attractive alternate at times when summer fogs plague the lower river and bay. Boat owners mooring at Yaquina Bay could be attracted by an agreeable destination for river cruising, some picnic grounds, and overnight mooring facilities. However, unless such a comprehensive program is developed, the future demand for marina facilities in Toledo will not be great.

Depoe Bay. A natural harbor offering excellent protection from wind and surge, it is immediately adjacent to the ocean fishing grounds. The entrance can be negotiated by small boats at any stage of tide and during all wind and sea conditions considered safe for small craft. Highway 101 crosses the entrance channel on a bridge some 60 feet above the water. The entire marina is visible from the bridge, and it has become a noted tourist attraction. The demand for expanded facilities here is great; however, the availability of land and water areas for expansion is extremely limited.



Siletz Bay, Taft. Siletz Bay, like Alsea Bay, has proximity but no access to the ocean. Anglers here must be content with bay and river fishing. The location selected here is adjacent to U. S. Highway 101 and the City of Taft, Oregon. It is visible from cars passing along the highway and would be a fine tourist attraction.

Property to be developed is owned by the Port of Newport. There is ample room for construction and future expansion.

### PRELIMINARY SITE PLANS

Alsea Bay, Waldport. The preliminary site plan for Alsea Bay, as shown on Figure 1-1, provides a small but complete marina in a location immediately adjacent to the town of Waldport and close to the best available fishing near the mouth of the bay. It provides 104 wet-slip moorages to replace the 50 spaces lost during the tsunami surge of 27 March 1964, and an additional six launching ramp lanes. Excavation and landfill will provide parking space for 100 cars and 144 cars with trailers and areas for administration and support facilities, such as bait and tackle shops, fuel stations, rest rooms, and attendant's office, and should be a part of the initial construction. The estimated cost of construction is \$350,000.

Yaquina Bay, Newport. Figure 1-2 shows a possible solution to the demand for small boat facilities in the Newport area during the period 1965 to 1975. The location is on land owned by the Port of Newport and particularly suited for dredging and landfill construction. It is also situated so as to be visible from U. S. Highways 20 and 101, and will be a potent tourist attraction. The proposed design would provide a basin with piers and floats for 476 wet-slip mooring berths and an equal number of automobile parking spaces on the adjacent filled area. Fourteen launch ramps would be provided together with 336 car-with-trailer parking spaces to accommodate the very heavy demands during salmon runs. Rest rooms, harbor master's office and administration, water supply, and electric power would be provided by the owner. Food service, fuel, charter service, boat and motor repair and bait, tackle, and supply sales could be provided by concessionaires on leased areas.

The estimated cost of the basic improvements by the owner is \$1,220,000.

Yaquina River, Toledo. Figure 1-3 shows a minimum type facility for this area where interest among local people is high, but use, experience, and data is meager. There is no lack of quiet water for moorages and construction in the location shown. Two launch ramps with back-up space for parking 150 cars with trailers, piers and floats to provide 54 wet-slip berths, and associated parking for some 130 cars should complete the basic operating facilities. Rest rooms and attendants office and water to the floats would be provided by the owner. Food service and fuel may be obtained on a concession basis. The estimated cost of construction by the owner is \$48,000.

Depoe Bay. Although the demand is higher than at any other location studied, this area cannot physically accommodate more than a 15 percent increase in small boats. Figure 1-4 shows a possible solution to this problem which provides four new launching ramps with parking for 90 cars and trailers, and piers and floats for 38 new wet-slip berths with associated parking for 81 cars. All other services of a complete marina are available. The estimated cost of providing the facilities shown is \$250,000.

Siletz Bay. A possible installation for Siletz Bay is shown on Figure 1-5. It is located adjacent to Taft, Oregon, with its support in the form of stores, shops, and restaurants, and within close view of the new Salishan resort. It is also visible and within a short distance of U.S. Highway 101. Facilities to be provided by the owner in addition to breakwater would include: Two launch ramps with associated parking for 53 cars with trailers, and piers and floats providing 100 wet-slip berths with parking space for 150 cars associated. The estimated cost is \$400,000.

### ESTIMATED OPERATING REVENUE AND EXPENSES

Table 7, which follows, indicates that revenues from launching fees, boat rentals, and concessions will approximate \$76,000 annually for the 5 facilities in Lincoln County. Expense is estimated to be \$51,000 annually, which would leave a profit of \$25,000 which could be reinvested in new facilities.





FIGURE 1-1  
 AREA REDEVELOPMENT ADMINISTRATION  
 SMALL BOAT HARBORS  
 AND RELATED MARINE FACILITIES STUDY  
 ALSEA BAY - WALDPOR



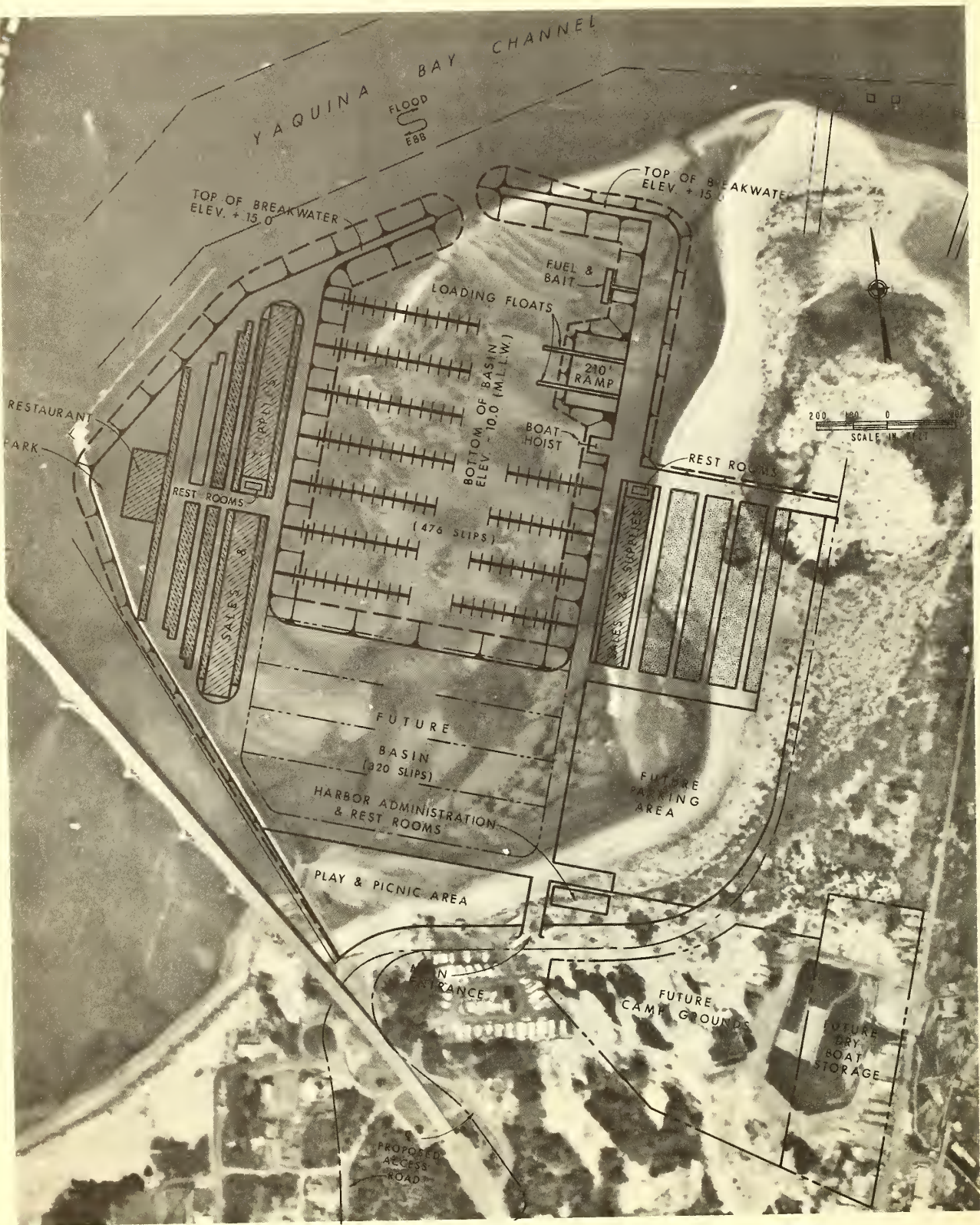





FIGURE 1-2

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY

YAQUINA BAY - NEWPORT

LEGEND

- |   |                         |
|---|-------------------------|
|  | SALES AND SUPPLIES      |
|  | CAR PARKING             |
|  | CAR AND TRAILER PARKING |



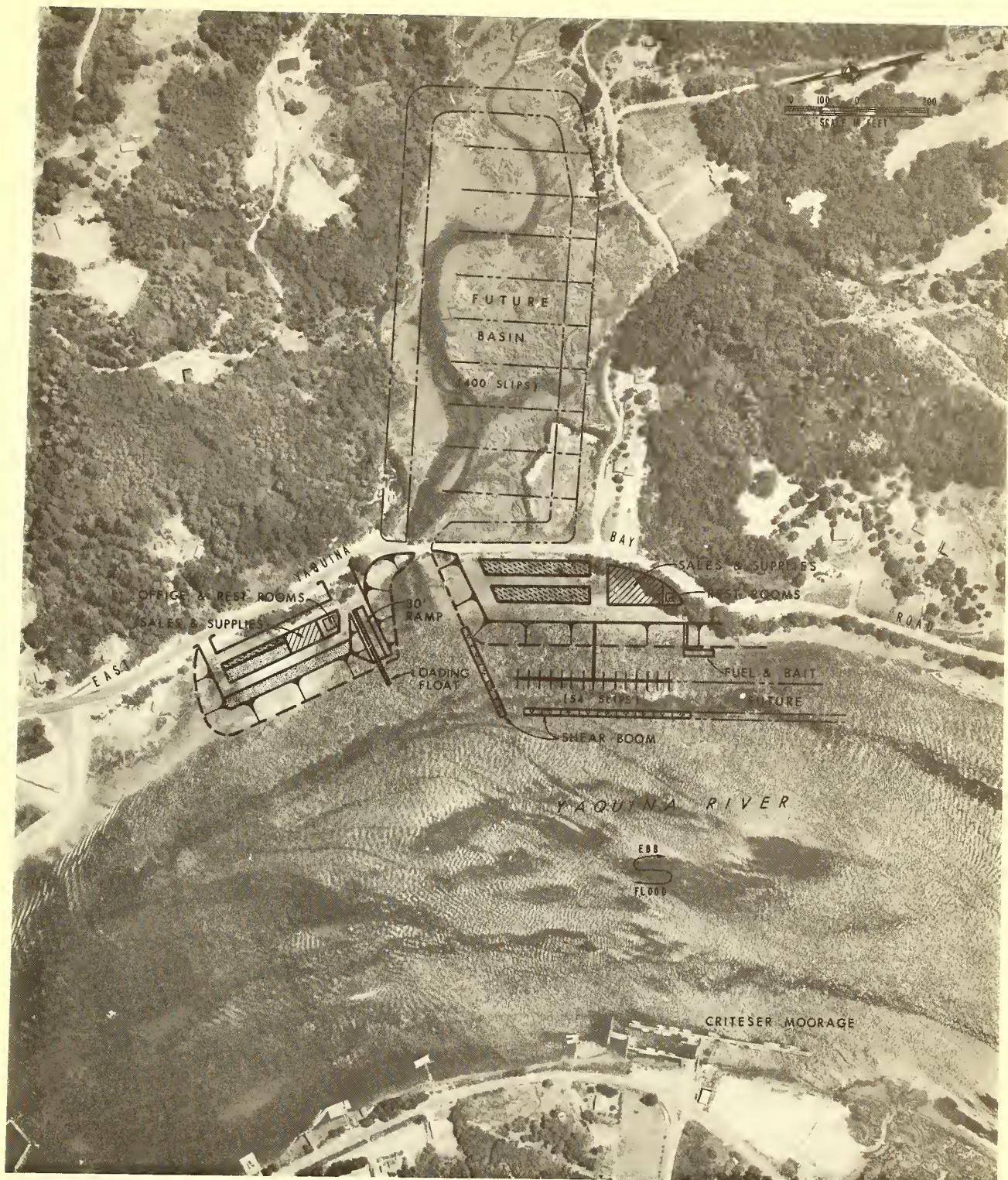





FIGURE 1-3

LEGEND

- |   |                         |
|---|-------------------------|
|  | SALES AND SUPPLIES      |
|  | CAR PARKING             |
|  | CAR AND TRAILER PARKING |

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY

YAQUINA RIVER-TOLEDO








FIGURE 1-4

AREA REDEVELOPMENT ADMINISTRATION  
 SMALL BOAT HARBORS  
 AND RELATED MARINE FACILITIES STUDY

# DEPOE BAY

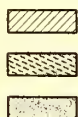
## LEGEND

- |   |                         |
|---|-------------------------|
|  | SALES AND SUPPLIES      |
|  | CAR PARKING             |
|  | CAR AND TRAILER PARKING |





# LEGEND



SALES AND SUPPLIES

CAR PARKING

CAR AND TRAILER PARKING

FIGURE 1-5

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY

SILETZ BAY - TAFT

TABLE 7

ESTIMATED 1975 REVENUES AND EXPENSES

FROM NEW MARINA FACILITIES

STUDY AREA 1

LINCOLN COUNTY

	<u>No. New Slips</u>	<u>Launch Ramps</u>	<u>Charter Service</u>	<u>Revenue Facility*</u>	<u>Charter</u>	<u>Expense</u>
Alsea Bay, Waldport	104	6	No	\$ 7,384	----	\$ 6,864
Yaquina Bay, Newport	476	14	Yes	33,796	\$20,944	31,416
Yaquina River, Toledo	54	2	No	3,834	----	3,564
Depoe Bay	38	4	No	2,698	----	2,508
Siletz Bay, Taft	<u>100</u>	<u>2</u>	No	<u>7,100</u>	<u>----</u>	<u>6,600</u>
Total	772	28		\$54,812	\$20,944	\$50,952

----

\* Includes revenues from mooring, launching, parking, concession, rentals, etc.

INDIRECT BENEFITS

The annual cost of an investment of \$2,450,000 in new small boat facilities in this County is, at three percent and 50 years, approximately \$95,000. As an offset against this cost may be placed the disbursements from State boat registration fees to the counties and from unrefunded gasoline tax collections. These could amount to \$19,000 and \$22,200 in



1963 and total \$60,000 in 1975. The balance, \$35,000, must be offset by indirect benefits. Other surveys have shown that the average "trailer-sailor" spends \$9.00 per day for boating. On the basis of 1,160 launchings per week over a 20-week season, income to the community would be \$210,000 per year.

Other indirect benefits will come to the area from employment in construction, operation, and maintenance of the new facilities. An approximate estimate of these benefits is given below:

Construction employment - 25,000 man-days  
Operation and maintenance - 1,640 man-days/year

The intangibles are benefits from increased vacationer and tourist traffic and the stimulation of the small boat industry on a much wider than county basis.

## CONCLUSIONS

It is feasible to construct new and expanded facilities for recreational boating in Lincoln County at the following locations, which are listed in relative order of priority.

Yaquina Bay	Newport Marina
Alsea Bay	Waldport Marina
Depoe Bay	(Launching Facilities)
Siletz Bay	Marina
Depoe Bay	Wet-slip berths
Toledo	Marina

The approximate scope of facilities to be included at each site is as listed in Table 7 and sketched on Figures 1-1 to 1-5, inclusive.

## CHAPTER III

### STUDY AREA 2 - CLATSOP AND COLUMBIA COUNTIES

#### LOCATION

Clatsop and Columbia Counties form the northwest corner of the State of Oregon, and have a combined area of 1,466 square miles, of which over 90 percent is forested. Columbia County is bordered on the east and north by the Columbia River and on the west by Clatsop County. Clatsop County is bordered on the north by the Columbia River and its estuary and on the west by the Pacific Ocean. U.S. Transcontinental Highway 30 parallels the Columbia River in both counties and terminates in Astoria. U.S. Highway 101 parallels the Pacific shore in Clatsop County, and U.S. Highway 26 joins 101 north of Cannon Beach and terminates in Astoria. Portland is 39 miles from the Clatsop County border by U.S. Highway 26 and 20 miles from Columbia County border by U.S. Highway 30. See Plate I-1 of Appendix I.

#### POPULATION

In 1963, Clatsop County had a population of 23,434 persons, while Columbia County had 23,858 persons. Clatsop County had declined by 14.4 percent in the three-year period from 1960 to 1963, while in that same period Columbia County had gained 6.6 percent. Astoria, with just under 10,000 people, is the largest city in either county. St. Helens, with 5,166 persons, is the largest city in Columbia County and the second largest city in the two counties. The coastal cities of Cannon Beach, Seaside, Gearhart, and Warrenton are resort centers, with an average summer population two to three times the normal population.

#### BOATING AND FISHING RESOURCES

Astoria's commercial fishing fleet is the largest in the State and its boats range from Cape Blanco on the south to Queen Charlotte Sound on the north. The Columbia River is a famous salmon fishing stream, which up to the present at least, is the only coastal stream open for commercial fishing. Cruising on the Columbia River is a popular recreation for the pleasure-boat owners, but offshore cruising is limited because of the lack of sheltered harbors between the mouth of the

Columbia and Tillamook Bay, some 40 miles to the south. The Columbia River estuary is wide and fairly open to the prevailing northwest winds which build up quite a chop on summer afternoons. This limits pleasure cruising in the Astoria area. Seaside and other beach resort towns on the Pacific could headquarter fishing areas offshore, but have no harbors from which small boats can reach the sea and return safely. The Columbia River offers salmon, steelhead, and sturgeon fishing.

## INVENTORY OF FACILITIES FOR BOATING AND FISHING

There are 18 moorages in Study Area 2 that provide 2,028 wet-slip berths and 12 launching ramps. Table 8 lists the facilities available at each site. Approximately 30 percent are in the Scappoose area, 27 percent in the Warrenton area, 17 percent in both Astoria and St. Helens areas, and 7 percent in the Rainier area. Most of the installations have a launching ramp, fuel, water, electricity, bait and tackle, auto and trailer parking, rest rooms and boat rentals. Less than half have a boat hoist, dry storage for boats, boat sales and repair, fish processing, restaurant, or charter service. Several of the islands in the river provide undeveloped camping areas. Among them are: Tenasillahe Island, Puget Island, Lord Island, Cottonwood Island, Sandy Island, and St. Helens sand bar.

## USE DATA

Boat registrations in Clatsop and Columbia Counties were obtained from the Oregon State Marine Board and from the U.S. Customs Service. These two counties rank 14th and 12th in the state in the number of boats under 21 feet in length, but third and second in the number of boats 21 feet and over in length. The total of boats in the two counties is 2,446 under 21 feet and 475 which are 21 feet and over.

Clatsop County has approximately 461 commercial fish boats and Columbia has 118 for a total of 579 registered commercial fishing boats. This is 39 percent of all the commercial fishing vessels registered in the state.

As to the category of use, the Oregon State Marine Board registrations give the breakdown shown in Table 9.

TABLE 8

EXISTING SMALL BOAT FACILITIES  
CLATSOP & COLUMBIA COUNTIES

MOORAGE NAME		PUBLIC OWNED	LOCATION RIVER - MILE	RAMP (LANES)	HOIST	FUEL	WET SLIPS	DRY STORAGE	SALES	REPAIR	WATER	ELECTRIC	BAIT, TACKLE	FISH PROCESS	PARKING	REST RMS.	RESTAURANT	CHARTER	RENTALS	
1	SEASIDE	X		1											X					
2	HAMMOND			1											X					
WARRENTON																				
1	WARRENTON BOAT BASIN	X	1.9 L				284				X	X			X	X				
2	WARRENTON BOAT YARD		1.9 R				30			X	X	X			X	X		X		
3	E.W. HENORICKSON & SONS		1.8 R		17.5 TON	X	215	8 (C) 25 (D)	X	X	X	X	X		X	X				
4	WARRENTON MARINA		1.7 R		13 TON	X	15	C			X	X			X	X				
							544													
ASTORIA																				
1	FISHERMANS DOCK		11 R				270	C			X	X	X		X	X	X	X		
2	ASTORIA YACHT CLUB		12 R	1			38								X	X				
3	ASTORIA MOORING		14 R	1			48				X	X			X					
							356													
RAINIER																				
1	RAINIER BOAT HARBOR	X	59.5 R	1		X	30				X	X			X	X			X	
2	CARTERS (PRESCOTT)		62.0 R	1		X	22				X	X			X	X			X	
3	GOBLE (GOBLE)		63.8 R	1		X	86				X	X	X		X	X				
							138													
ST. HELENS																				
1	PARKS PORT		75.0 R	1		X	107	C	X	X	X	X	X		X	X			X	
2	RALPHS MACHINE SHOP		75.0 R			X	80			X	X	X			X	X			X	
3	PACIFIC MARINA		77.7 R	1		X	165	C	X	X	X	X	X			X			X	
							352													
SCAPPOOSE																				
1	COON ISLAND		80.6 R	1		X	100	C			X	X	X		X	X			X	
2	PETE'S		80.7 R	1		X	120				X	X	X		X	X			X	
3	JANE'S (MULT. CO.)		82.6 L	1		X	100		X		X	X	X		X	X			X	
4	DIKESIDE "4"		83.2 R			X	262	C	X		X	X	X		X	X			X	
5	BROWNS		83.3 R	1		X	58		X		X	X	X		X	X			X	
							638													
TOTAL CLATSOP & COLUMBIA COUNTIES 19 MOORINGS					13	2	13	2028	7	6	5	17	17	10		18	15		2	10

P = PLANNED    O = OPEN    C = COVERED    Y = MAJOR REPAIRS REQUIRED  
R = RIGHT SIDE RIVER    L = LEFT SIDE RIVER

TABLE 9

## SMALL BOAT USES IN STUDY AREA 2

		<u>Percent</u>
Pleasure	1,361	74
Livery	53	3
Dealer	3	--
Commercial Fishing	363	20
Passenger, Commercial	2	--
Tug	26	1
Other	<u>30</u>	<u>2</u>
Total	1,838	100

Sports Fishing. The anglers trips and catch at the mouth of the Columbia River are summarized in Table 10. Both Washington and Oregon based anglers are included in these figures. It may be noted that the average annual catch for those years was 93,100 fish taken on some 84,900 angler trips. River fishing accounted for an annual average of some 14,920 fish during the five-year period from 1955 to 1959, inclusive.

Commercial Fishing. In the five-year period from 1958 to 1962, the poundages of fish landed at Astoria averaged over 5,000,000 pounds per year with a high of 6.8 million pounds in 1959 and a low of 2.0 million pounds in 1961.

PROBABLE DEMAND FOR NEW BOATING AND FISHING FACILITIES  
(1965 to 1975)

The future of commercial fishing in Clatsop and Columbia Counties is not bright. The Oregon State Fish Commission does not expect any major changes in availability or catch of salmon offshore in the next decade. A referendum to close the Columbia River to commercial fishing was defeated by the voters of Oregon in the November 1964, election.

Since crabs and salmon are now fully utilized, the only hope for increased production in the fishing fleet is that a market will be developed for under-utilized species. A recent article in the "Marine Digest," published in Seattle, Washington, indicates that some progress is being made along this line.



Growth projections for pleasure boating in Clatsop and Columbia Counties indicate that 2,487 boats will be hauled in and 1,590 boats will be moored in the area in 1975. This represents 1.46 and 1.42 increases over 1964 figures.

TABLE 10

ESTIMATED COLUMBIA RIVER - OCEAN SPORT CATCH OF SALMON  
1958 THROUGH 1962\*

<u>Year</u>	<u>Angler Trips</u>	<u>Chinook</u>	<u>Silvers</u>	<u>Total Fish</u>	<u>Catch per Angler Trip</u>
1958	66,000	25,000	39,600	65,200	0.99
1959	75,000	23,400	50,500	73,900	0.99
1960	78,000	37,700	34,600	72,300	0.93
1961	89,000	20,500	85,500	106,000	1.18
1962	116,400	29,900	118,900	148,000	1.28

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\*Oregon State Game Commission

SELECTION OF SITES FOR NEW FACILITIES

Seaside. The community of Seaside now has no access to the ocean and a very minimum of boating activity. The Necanicum River is not suitable for water skiing because of inadequate surface area, and several bridges limit access to the upper river. In order to provide boating here, a deep channel through the breakers or a jetty must be provided to stabilize an entrance channel and to permit safe passage. The large summer population (10,000) represents an average potential of 435 boat owners. Since Seaside is a resort and vacation town, the percentages of boat owners would probably be higher than the State average. The construction of a marina would draw additional boaters as vacationers in the area. It would also provide an interesting and safe port for pleasure cruise sightseers who could come down the Columbia and safely into Seaside within the range of protection of the small craft warning service. Some crab fishermen might transfer from Astoria.



Warrenton. Warrenton now has a busy marina which is popular with the sport fisherman who moor their boats. It is some four miles nearer to the mouth than Astoria. The shortcomings of this facility are: lack of a launching ramp; lack of auto and trailer parking and support facilities, such as boat and motor repair, fuel facilities, etc.; restaurant or clubhouse. Boat hoists, fuel, and repair facilities are available in privately owned installations just across the channel. A sand launch ramp which is very popular is available at the Coast Guard Station at Hammond, which is three and one-half miles away, and also that much closer to the prime fishing ground at the mouth.

Astoria. Astoria now has moorings for 356 boats, but no complete marina. Two moorings are now available. The Fisherman's Dock with some 270 slips is loaded to capacity, but will soon require major repairs. Parts of piers have now deteriorated to the point where they are unsafe for even pedestrian traffic. Although the moorage provides quiet water, this is not a popular mooring for small pleasure craft because of the wind and sea conditions outside. Frequent rain and fog occur during the winter, and in summer almost every afternoon brings a strong northwest breeze. The Astoria Mooring Basin is larger and in new condition, but suffers from the deficiency of inadequate wave protection. The combination of an ebb tide and strong river currents produces an agitation in the basin which leads to damage of small craft and the floats which lie alongside. As a consequence, and also because of the added distance from the river mouth, the Astoria Mooring Basin is relatively unused.

Rainier. Rainier is not a complete facility, but very popular in its limited way. It has space for some 30 small boats at the floats and a very nice swimming beach. Boaters from up the river and from neighboring Longview, Washington, like to picnic on the nearby sand islands, fish in the channel and visit Rainier as an interesting port of call. The addition of facilities here, such as boat and motor sales and repair, bait and tackle shops, and a restaurant would complete the marina and make it more attractive to the boater.

St. Helens. St. Helens is only 20 miles from Portland and near several of the best fishing areas in the Columbia above the mouth. The existing facilities include three moorings with 352 boat slips all under private ownership. Except for the lack of restaurant facilities, the group at the town site may be considered as a complete marina. The demand for additional space and facilities here will probably continue to grow at a faster rate than at any other place in the County. The Scappoose area, which is five or six miles closer to Portland, with some 638 slips

already has almost one-third of the two county moorings. This fact indicates the advantage of a favorable location in relation to a metropolitan area.

## PRELIMINARY SITE PLANS

Preliminary site plans for Area 2 are shown on Figures 2-1 and 2-5, inclusive. The plan for Seaside envisages a complete new harbor and marina. The other four plans provide extensions and additions to existing facilities. Pertinent details concerning the design of each site plan are given in the paragraphs which follow:

Seaside. The problem here is to provide a harbor entrance in water deep enough to prevent most storm waves from breaking. The solution shown on Figure 2-1 utilizes two breakwaters extending out from the shores of a natural cove to deep water, and enclosing a harbor water area of some 77 acres. Although the construction of these breakwaters is estimated to cost some \$3.9 million dollars, their combined length and cost is about the minimum which will provide the necessary protection, and the water area enclosed is a relative maximum. Ample room is provided for a 16-lane launching ramp and 130 wet-slip berths as an initial increment. Room is available for several times the original number of berths. The estimated cost of this initial construction is \$5,520,000.

Development of the site tentatively selected for the Seaside marina will require further investigation before a firm plan can be prepared. Among the items to be investigated are the nature and extent of subsurface and underwater soils and rock formations. The proximity of large rock shore outcroppings in the vicinity indicates a probability of encountering rock in dredging operations here. The elevation selected for the top of the breakwater will also have an important effect on construction costs. The minimum elevation of 15 feet above mean lower low water as shown on Figure 2-1 will depend on realization of considerable protection from the sea by Tillamook Head. Further investigation of sea and swell conditions in the cove may show the necessity for an additional increment of height of five to eight feet or more. Realignment of the north breakwater has been considered for the purpose of reducing foundation depths and total height of the structure. Such reduction would also have an important effect on costs and would tend to offset the expense of additional height for wave protection, if required.

Warrenton. The City-owned small boat basin needs only the addition of launching ramps and car and trailer parking areas to make it a complete marina. The installation of 13 launching ramp lanes with some 320 car and trailer parking spaces will fulfill the demand expected in the

1965-75 period. An additional 92 wet-slip berths, together with parking space for 418 cars, will be required as is shown on Figure 2-2. The estimated cost of improvements is \$240,000.

Astoria. In view of the steady decline of the fishing fleet and the number of berthing spaces which are available and unused in existing small boat basins, the problem here is one of consolidation rather than expansion. Figure 2-3 shows how such consolidation could accommodate the existing fishing fleet in the Astoria Mooring Basin and provide some space for growth in use by recreational boaters. Four hundred ninety-five wet-slip berths can be provided under this arrangement. Land areas at this moorage are in short supply, and it is contemplated that some of the private land which borders the existing marina will have to be taken to provide necessary administration and parking areas. Spaces for parking

274 cars and 24 cars with trailers are shown. A location is also shown for a restaurant, office, and rest rooms, and supply and service facilities. The estimated cost of outfitting the existing basin for the use contemplated is \$500,000. The Fishermen's Dock could likewise be developed, but both are not now required.

Rainier. The schematic plan shown on Figure 2-4 shows how the existing facility may be expanded to accommodate two and two-thirds times the present capacity for wet-slip berths (80 slips). The existing single lane launching ramp would be expanded to three lanes with car and trailer parking for 74. Car parking space for 76 cars, as shown, will probably require augmentation in adjacent land areas once operation begins. A fuel and bait facility, a harbor office, and marina sales and supplies shops would make the service complete and attractive. The estimated cost of owner-furnished facilities is \$110,000.

St. Helens. A 27-acre site on Scappoose Bay, owned by the Port of St. Helens, is now operated under lease as the Pacific Marina. Of all the sites studied, this location is the closest to the Portland metropolitan area and its thousands of recreation boaters. The 10 additional launching ramp lanes and 200 wet-slip berths needed in the area during the 1965 to 1975 period can be accommodated here with ease. Land area is ample and easily developed for the associated parking of 240 cars with trailers and 368 cars. A harbor office, food service and water to the slips would make this a complete marina. Figure 2-5 shows a possible layout to accommodate the expanded facilities. The estimated cost of construction is \$358,000.

## ESTIMATED OPERATING REVENUE AND EXPENSES

Table 11, which follows, shows the estimated operating revenue and expense items for the new facilities proposed in Clatsop and Columbia Counties. These estimates are based on recent experience of somewhat larger marinas operating on the Oregon Coast, which, from the standpoint of income, are believed to be conservative. It may be noted that the average revenue compiled for the area is \$77,000/997 or approximately \$77.00 per slip per year. As is estimated in a recent study, berthing alone in first class public marinas in Michigan is expected to produce some \$175 per slip per year, and other incidental revenues of a complete marina will produce an additional \$725 per slip per year. The total expected revenue for the Michigan area is \$900 per slip per year, or almost 13 times the revenue estimated for this Oregon area. Comparison of these figures indicates that the present state of development of



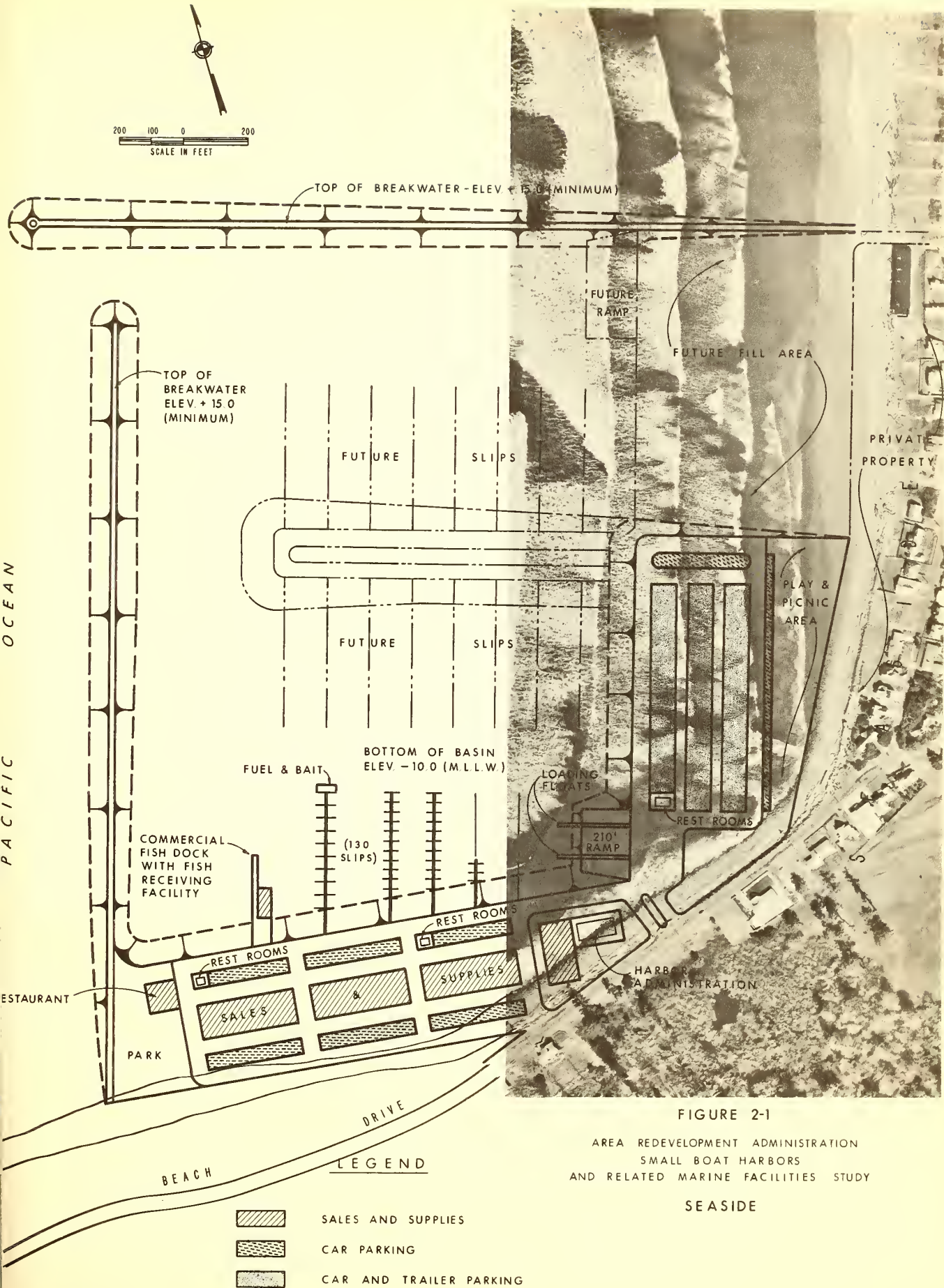
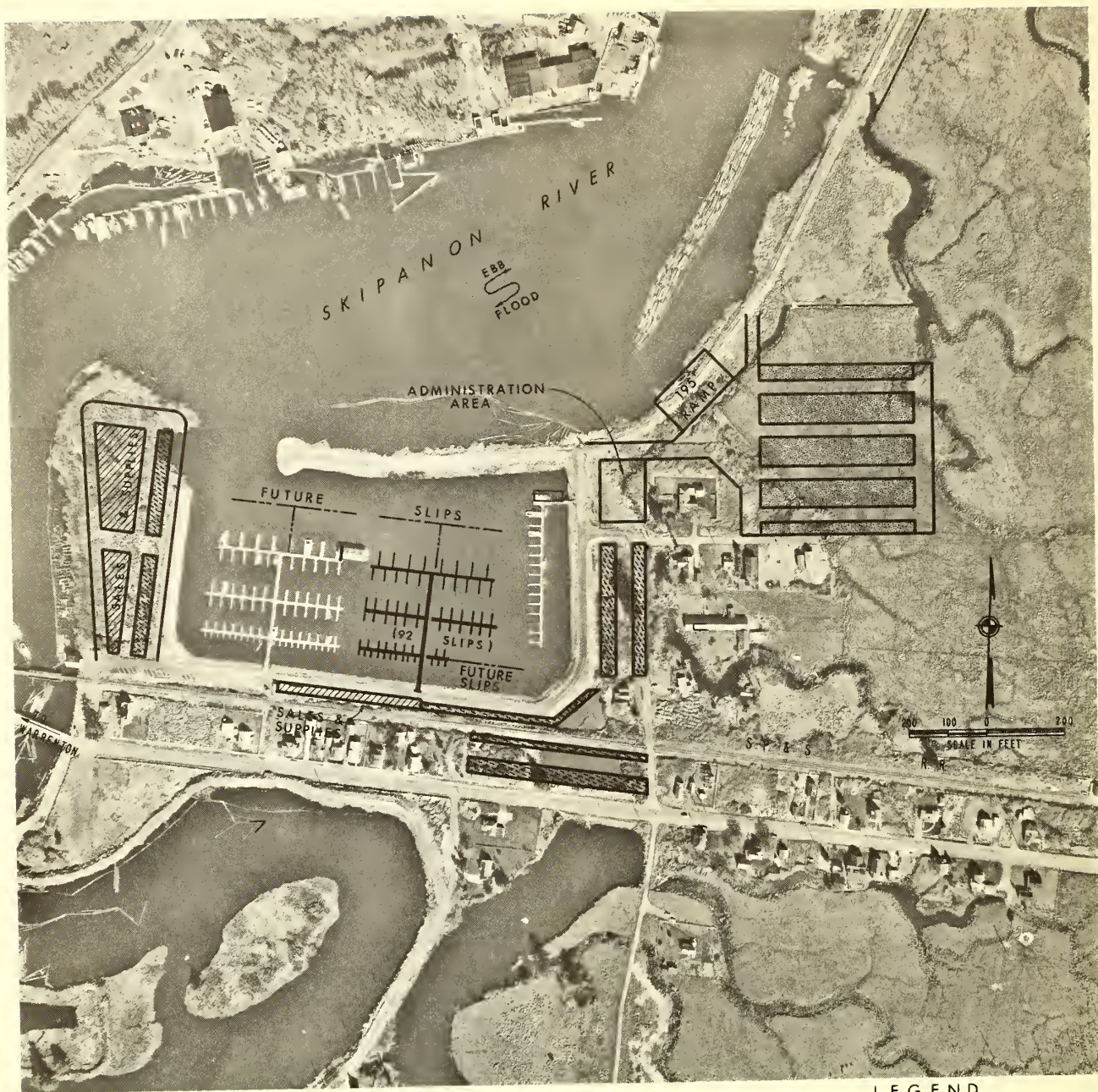


FIGURE 2-1

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY

SEASIDE





# LEGEND




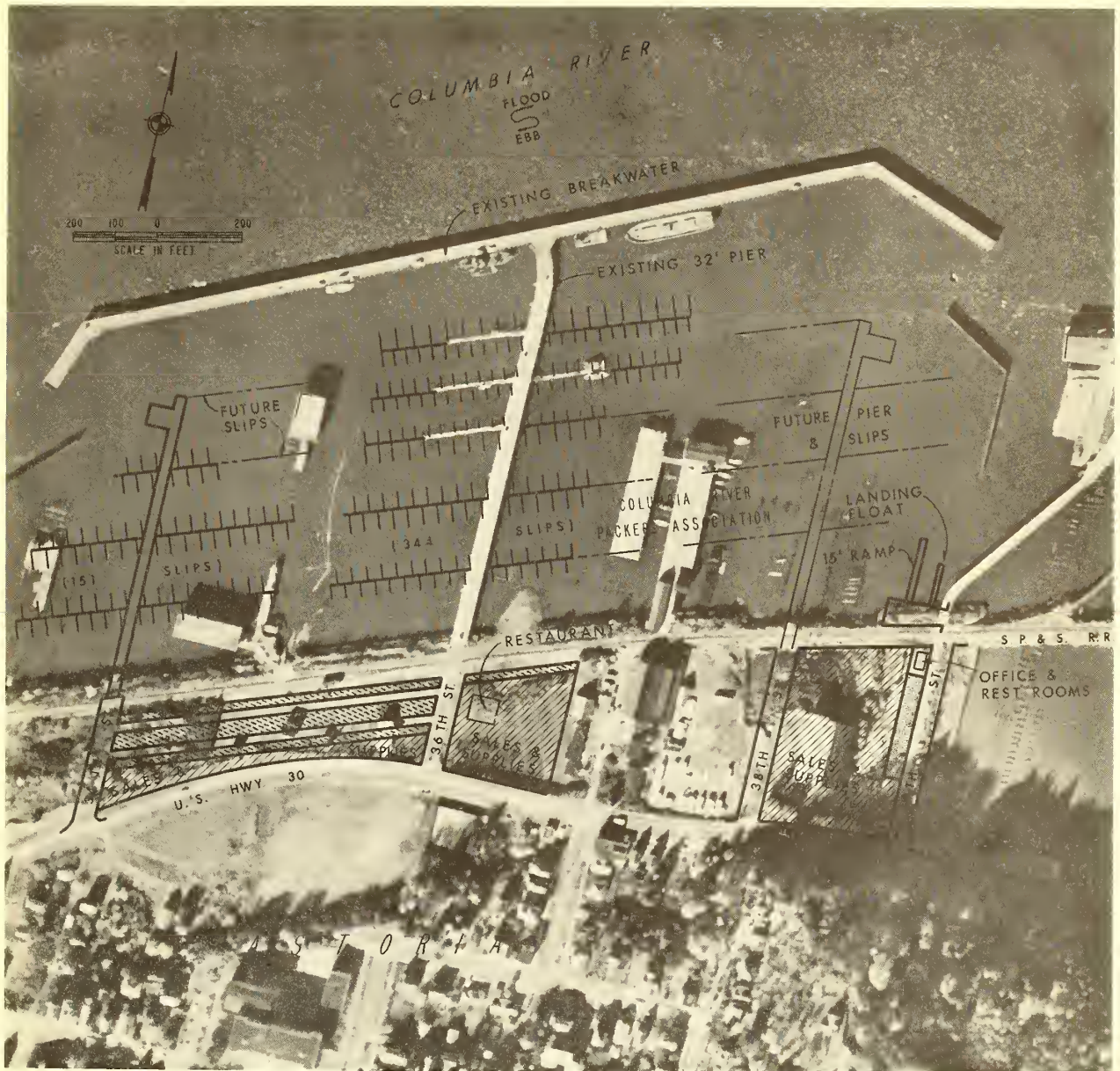
-  SALES AND SUPPLIES
-  CAR PARKING
-  CAR AND TRAILER PARKING

FIGURE 2-2

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY

WARRENTON





# LEGEND




	SALES AND SUPPLIES
	CAR PARKING
	CAR AND TRAILER PARKING

FIGURE 2-3

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY

ASTORIA





# LEGEND




-  SALES AND SUPPLIES
-  CAR PARKING
-  CAR AND TRAILER PARKING

FIGURE 2-4  
 AREA REDEVELOPMENT ADMINISTRATION  
 SMALL BOAT HARBORS  
 AND RELATED MARINE FACILITIES STUDY  
 RAINIER








FIGURE 2-5

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY

ST. HELENS

LEGEND

- |   |                         |
|---|-------------------------|
|  | SALES AND SUPPLIES      |
|  | CAR PARKING             |
|  | CAR AND TRAILER PARKING |

marinas in Oregon is not up to the standard of certain other areas and that the Oregon boat owner may be willing to pay considerably more for better facilities of the type proposed.

TABLE 11  
ESTIMATED 1975 REVENUES AND EXPENSES  
FROM PROPOSED MARINA FACILITIES  
STUDY AREA 2  
CLATSOP AND LINCOLN COUNTIES

	<u>No. New Slips</u>	<u>Launch Ramps</u>	<u>Charter Service</u>	<u>Revenue Facility*</u>	<u>Charter</u>	<u>Expense</u>
Seaside	130	14	Yes	\$ 9,230	\$ 5,720	\$ 8,580
Warrenton	92	13	Yes	6,532	1,012	6,072
Astoria	495	1	---	35,145	---	32,670
Rainier	80	3	---	5,680	---	5,280
St. Helens	<u>200</u>	<u>10</u>	---	<u>14,200</u>	<u>---</u>	<u>13,200</u>
Total	997	41		\$70,787	\$ 6,732	\$65,802

-----  
\*Includes revenues from mooring, launching, parking, concession, rentals, etc.

#### INDIRECT BENEFITS

The annual cost of an investment of \$6,728,000 in new small boat harbors and related marine facilities in the two-county area is at three percent and 50 years, \$258,000. As an offset against this cost may be placed the disbursements from boat registration fees and from unfunded gasoline tax, which could amount to some \$50,000 per year, leaving a balance of \$208,000 per year, which must be offset by indirect benefits.

Other surveys have shown that the average trailer-sailor will spend \$9.00 per day. With 1,500 launchings per week for a 20-week season, the income to the community would be increased by \$270,000. Visitors coming by water from other ports may be expected to spend as much as \$200 per port of call. With some 250 visitors per week over a 20-week season, the income to the community would be \$1,000,000.

## CONCLUSIONS

Additional small boat harbors and related marine facilities will be needed in Clatsop and Columbia Counties to meet increased recreational needs during the period 1965-1970. It is feasible to construct new facilities for recreational boating at Warrenton, Rainier, and St. Helens, and to a very limited extent at Astoria. Seaside, where the need is greatest, also has the problem of creating a complete new harbor with protective breakwater. Because of the relative expense, it is believed that the Seaside location should be studied separately, and a priority for construction is tentative at this time. The problem at Astoria is to consolidate rather than to expand existing facilities. The recommended priority for construction in the general area of Clatsop and Columbia Counties is:

1. Warrenton
2. Astoria
3. Seaside
4. St. Helens
5. Rainier



## CHAPTER IV

### STUDY AREA 3 - HOOD RIVER, WASCO, AND SHERMAN COUNTIES

#### LOCATION

These three counties, located where the gorge of the Columbia River breaks through the Cascade Mountain Range of Oregon and Washington, had practically no waters navigable for small boats until the great power dams of the Columbia River System backed up vast pools. Now, from Bonneville to The Dalles and from The Dalles to John Day is relatively quiet water, and boating is an increasing recreation activity.

The westerly border of Hood River County is some 38 miles east of Portland, and Hood River, Wasco, and Sherman Counties extend some 79 miles along the Columbia River. The east boundary of Sherman County is 117 miles east of Portland. The south boundary of Wasco County is between 50 and 60 miles south of the Columbia River. See Plate I-1 of Appendix I.

The major stream tributaries to the Columbia are Hood River, Deschutes River, and John Day River. None of these streams are navigable except for very short stretches. Lost Lake in west central Hood River County and Frog and Clear Lakes in southwestern Wasco County are the only lakes of any size in the area.

Interstate Route 8 on U.S. Highway 30 follows the Columbia and provides communication with Portland to the west and Pendleton to the east. U.S. Highway 97 runs north through Sherman County meeting Interstate 80N at Biggs. U.S. Highway 197 runs north through Wasco County meeting Interstate 80N at a point three miles east of The Dalles. State Highway 35, the easterly part of the scenic Mt. Hood Loop, runs north through Hood River County, meeting Interstate 80N at Hood River. There are small airfields at Hood River and The Dalles. There are seven state parks on the highway between Bonneville and The Dalles, one with camping facilities at Viento. There are no State parks east of The Dalles or in Sherman County.

#### POPULATION

Population figures shown in Table 12 are taken from an official report of the Oregon State Board of Census.

TABLE 12

## STUDY AREA 3 - POPULATION - COUNTIES AND CITIES, 1963

<u>Counties</u>	<u>Population</u>	<u>Percentage Change 1960 to 1963</u>
Hood River County	13,739	+ 2.6%
Wasco County	22,517	+11.4%
Sherman County	3,376	+38.0%
Oregon	1,856,190	+ 4.9% (1.02% per year)
<u>Cities</u>		
Cascade Locks	660	0.0%
Hood River	3,761	+ 2.8%
Wasco	430	+23.6%
The Dalles	10,834	+ 3.2%
Dufer	525	+ 7.6%
Maupin	405	+ 6.3%

The construction work on the John Day Dam near the eastern boundary has attracted a rather large number of people to Sherman County. These cannot be considered as permanent residents of the County, so the growth rate is not actually as large as the figures would indicate.

BOATING AND FISHING RESOURCES

Except for the lakes previously noted, the Columbia River is the only boating and boat-fishing resource of the three-county area. The principal features of the area are listed as they may be observed by a boater in traveling the 62 miles up the Columbia River from west to east and are shown in Table 13.

TABLE 13

## BOATING INTEREST

River Miles

126	Bonneville Dam and Locks - west boundary Hood River County
129	Cascade Locks - launching ramp, shelter for boats, automobile parking
133	Mouth of Wind River - salmon and steelhead
141	Drano Lake - salmon and steelhead
148	Hood River, Yacht Basin, launching, fuel, mooring, auto and trailer parking
156	Mouth of Klickitat River - salmon and sturgeon
165	Sturgeon fishing near The Dalles
166	The Dalles Boat Basin, launching ramp, mooring, fuel
174	Celilo Park, public launching ramp, picnic, auto and trailer parking
177	Mouth of Deschutes River, gravel boat launching ramp, parking area
188	John Day Dam site (under construction)
190	John Day River mouth - east boundary Sherman County

INVENTORY OF FACILITIES FOR BOATING AND FISHING

In the 64 nautical miles of the Columbia River which forms the north boundary of the Group III counties, there are 6 installations which provide a service for small boats. Only two of these installations offer wet-slip moorage; these are the boat basins at Hood River and The Dalles. All six installations provide launching ramps and automobile and trailer parking and five of the six have public rest rooms. Fuel is available only at Hood River and The Dalles. Table 14 shows the facilities available to boat owners at each location.

USE DATA

There is actually very little factual data available concerning the boat fishery in this section of the Columbia River. Estimates by the State Game Commission, as shown in Table 15, indicate that the catch of salmon and steelhead during the period 1955 to 1959, inclusive, has varied from a total of 920 fish in 1957 to a total of 2,600 fish in 1959.

TABLE 14

EXISTING SMALL BOAT FACILITIES  
HOOD RIVER, WASCO, & SHERMAN COUNTIES

MOORAGE NAME	LOCATION RIVER - MILE	RAMP (LANES)	HOIST	FUEL	WET SLIPS	DRY STORAGE	SALES	REPAIR	WATER	ELECTRIC	BAIT, TACKLE	FISH PROCESS	PARKING	REST RMS.	RESTAURANT	CHARTER	RENTALS
1 CASCAOE LOCKS	129	1	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-
2 HOOD RIVER	148	1 <sup>A</sup>	X	X	61*	-	-	X	X	X	-	-	X	X	-	-	-
3 MAYER PARK	157	1 <sup>G</sup>	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-
4 THE OALLES	168	1 <sup>A</sup>	-	X	85**	-	-	-	X	X	-	-	X	X	-	-	-
5 CELILO	174	1 <sup>G</sup>	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-
6 MOUTH OF DESCHUTES RIVER	177	1 <sup>G</sup>	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-
TOTAL		6	1	2	146			1	2	2			6	5	1	1	1

\* INCLUDES 11 PRIVATE BOATHOUSE MOORAGES.

A = ASPHALT SURFACE  
G = GRAVEL SURFACE

\*\* INCLUDES 39 PRIVATE BOATHOUSE MOORAGES.

TABLE 15

COLUMBIA RIVER SALMON AND STEELHEAD SPORT CATCH  
FOR THE YEARS 1955-1959 IN WATERS ADJACENT TO  
HOOD RIVER, SHERMAN, AND WASCO COUNTIES\*

<u>Species</u>	<u>1955</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>
Salmon	300	250	220	500	1,100
Steelhead	1,400	700	700	550	1,500

----

\* Oregon State Game Commission

PROBABLE DEMAND FOR NEW BOATING AND FISHING FACILITIES  
(1965 to 1975)

Since Area 3 counties are increasing in population at a rate of more than three percent a year as compared to the one percent per year for the State as a whole, it may be reasonable to assume that the boating activity in Area 3 counties will follow an increasing trend and that numbers of boats owned will increase in proportion to the number now on hand. On the basis of a state-wide survey of small boat owners, it is estimated that there will be 721 boat owners in the area in 1965 and that this number will increase to 1,054 by the year 1975. Almost three-quarters (767) of these boats will be hauled by trailer to launching sites. The remainder (287 boats) will be moored during the boating season.

SELECTION OF SITES FOR NEW FACILITIES

Two of the existing small boat facilities in this three county area have room for future expansion. If the entire anticipated increase in boats owned for the period 1965 to 1975 is distributed among the sites mentioned, the planning figures may be as shown in Table 16.



TABLE 16

## PRESENT AND ESTIMATED FACILITIES

	1963		Increase		1975	
	WS*	R*	WS	R	WS	R
Cascade Locks	0	1	33	0	33	1
Hood River	91	1	113	9	204	10
The Dalles	85	1	38	6	123	7
Mouth of Deschutes	0	1	50	0	50	1
Total	176	4	234	15	411	19

\* WS - Wet slips

R - Ramps

Cascade Locks. This municipally owned facility is a pleasant and attractive park located on former U. S. Government locks property. Unfortunately, it is not visible from main highway (U. S. 30). There is no development here now except for a launching ramp and picnic areas. In order to provide the complete service which will attract boaters, the following facilities should be installed

1. Wet-slip mooring floats, piers
2. Fueling facility
3. Harbormaster Office
4. Food service
5. Water

Hood River. The existing municipally owned boat facility has an excellent location that is visible from U. S. 30 and has good access and accessibility to downtown shops and restaurants. Facilities are now fairly complete, but need dry storage, sales, tackle shops, coffee shop to operate complete service, and attractive picnic areas. There is plenty of room for expansion at minimum cost.

The Dalles. The present boat basin, owned by the Port of The Dalles, has adequate water areas and is well protected from river currents, waves, and wind. Access from Interstate Route 80N is good; however, access from the City of The Dalles is difficult. Also, on the debit side, the recent relocation of the highway has left the boat basin

with a parking area which is barely adequate for present operations and which has no capacity for expansion. The western half of the boat basin is completely cut off to access from the eastern half and from the City. The variation in the Bonneville Dam pool level from Elevation +72 to approximately Elevation +90 makes creation of new land areas by filling an expensive undertaking. A limited area of flood plain which could possibly be filled in this way lies to the east of the basin but is so situated that the distance from parking to piers would be excessive.

Mouth of the Deschutes. This area is undeveloped except for a gravel launching ramp which is not too well defined or maintained. Parking areas have not been improved, and there is no supporting community. Wasco, the closest city, has a population of 430 people, and is 14 miles distant. The surrounding hills are barren and the general impression is rather lonely and desolate. The Deschutes does, however, have a reputation as an excellent fishing stream. This reputation, together with the fact that there are no other more attractive harbors in Sherman County, will guarantee its use in the future. On the credit side, the site does have ample protected water area with access to the Columbia River, except at times of extreme high water when the railroad and highway bridges may interfere. The soil appears to be sand and gravel which is adaptable to dredging and filling for development. (Soil borings will be required to determine the presence and extent of rock in the area.) Apparently, there are no records of use for this harbor. Installation of a minimum facility here is suggested until usage data can be compiled.

## PRELIMINARY SITE PLANS

Preliminary site plans for the Cascade Locks, Hood River, The Dalles, and Deschutes River mouth areas have been prepared and are included in this Chapter as Figures 3-1 to 3-4, inclusive. A brief discussion of each separate area follows:

Cascade Locks. Cascade Locks' major deficiency will be remedied with the construction of a new pier and floats providing 52 new wet-slip berths. An additional launching ramp, parking for 70 cars and 35 cars with trailers, as shown on Figure 3-1, will attract boaters from a wide area. Water should be provided on the floats by the port, and food service and fuel on a concession basis by local businesses. The natural park-like setting is excellent and a well constructed and maintained marina here should draw many customers from the Portland fleet. The estimated cost of the new facilities shown is \$80,000.

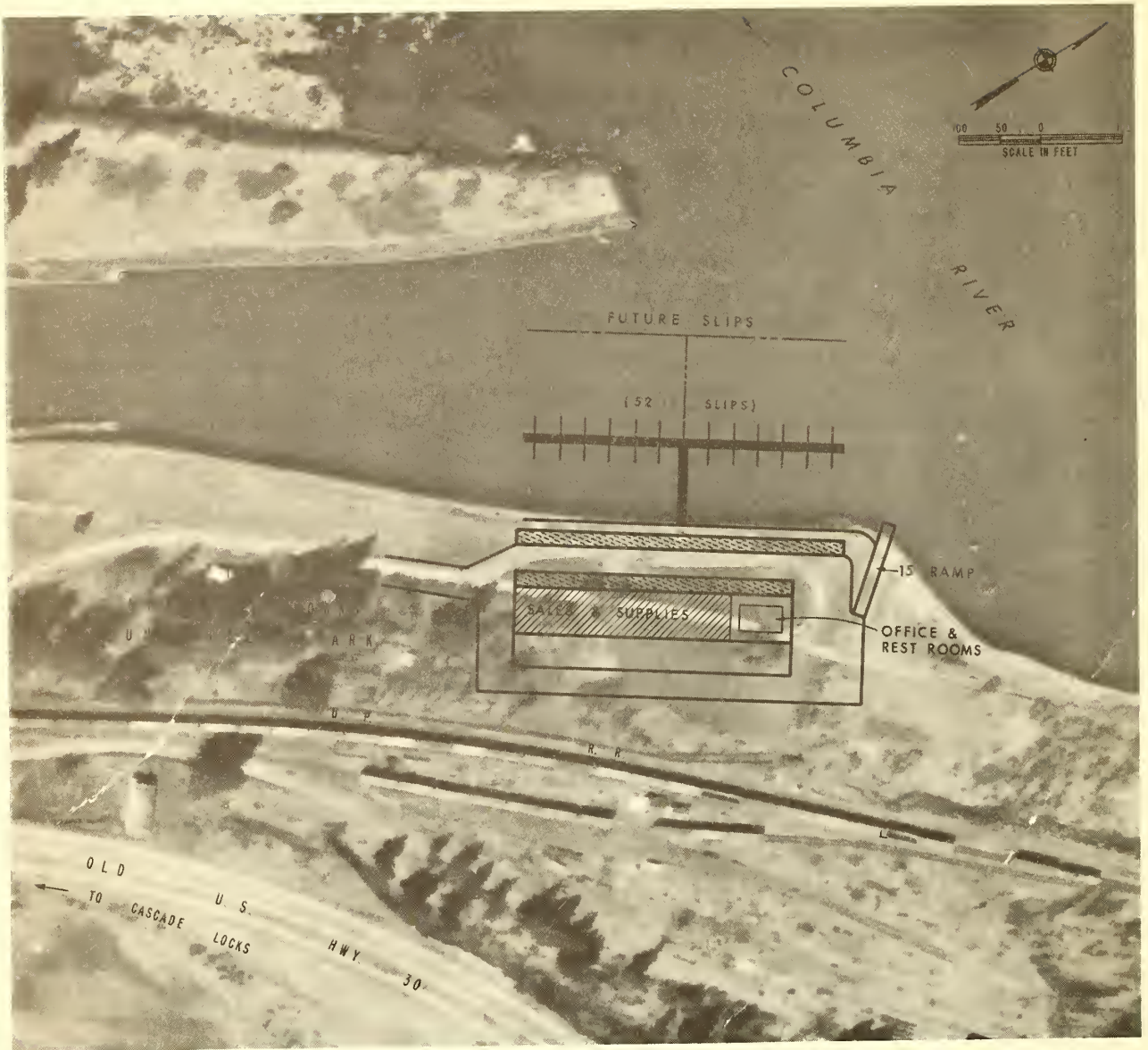
Hood River. Hood River with its well developed fleet and small boat harbor is in a position to accommodate the largest share of the expected increase in demand for facilities in the future. A new pier and floats providing 124 wet-slip berths for small craft, plus 10 additional launching ramp lanes, should meet the requirements for the period of the next ten years. In conjunction with the new berths and launching facilities, an additional parking space for 148 cars and 240 cars with trailers should be provided. Local business should be encouraged to provide food service on a concession basis. Figure 3-2 shows a suggested layout for the proposed improvements. The estimated cost of the new facilities shown is \$210,000.

The Dalles. The Dalles has a boating problem which, it is believed, can only be solved with a large expenditure of money. Although protected water area is available for additional moorage in the basin, land area suitable for access and parking can be provided only by means of extensive filling operations. Figure 3-3 shows a suggested means of utilizing such filled areas to support the six additional launching ramps and 77 new wet-slip berths which may be required in the period 1965-1975. Parking for some 100 cars and 144 cars with trailers is considered desirable. The estimated cost of the new facilities shown is estimated to be \$640,000.

It is suggested that consideration be given to an alternate location for new boating facilities in The Dalles area, such as at the Mayer State Park in Rowena. The location at Rowena is most attractive and has picnic grounds and rest rooms. Soil conditions and topography here appear to be good and certainly are relatively superior.

Mouth of the Deschutes. Deschutes River mouth, as shown on Figure 3-4, has been designed to provide a minimum facility until better usage data can be obtained. Construction here should be relatively simple and the pier and floats to provide 52 new wet-slip berths should present no problem. Fifty car parking spaces and 25 spaces for car with trailer parking would complete the major work. Rest rooms, an attendant's office, and food service facility would make the harbor attractive to local residents and tourists as well. The rest rooms should be constructed by the owner and the food service may be by concession. The cost of these improvements, as shown, is estimated to be \$90,000.





#### LEGEND




	SALES AND SUPPLIES
	CAR PARKING
	CAR AND TRAILER PARKING

FIGURE 3-1

AREA REDEVELOPMENT ADMINISTRATION  
 SMALL BOAT HARBORS  
 AND RELATED MARINE FACILITIES STUDY  
 CASCADE LOCKS



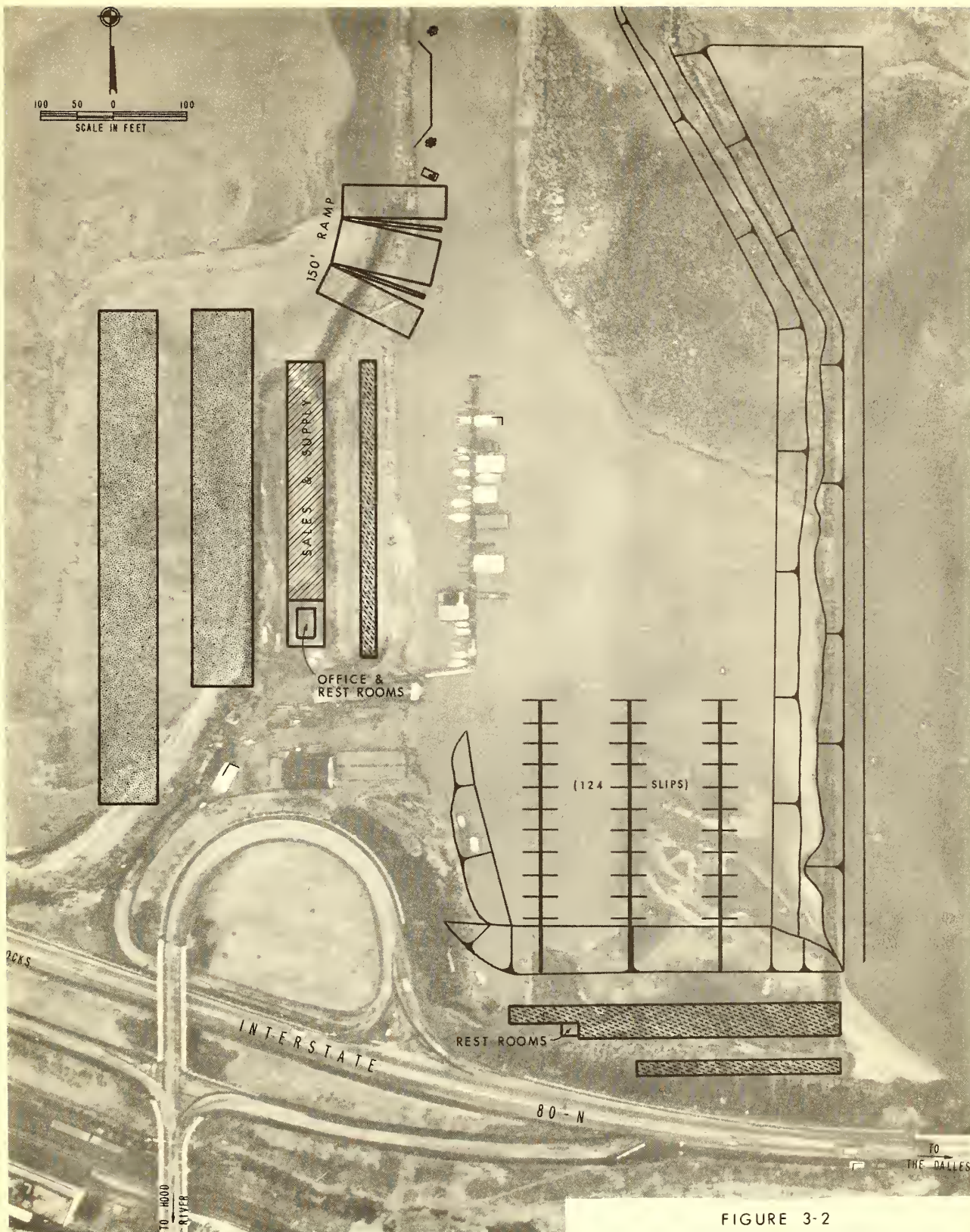


FIGURE 3-2

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY

HOOD RIVER



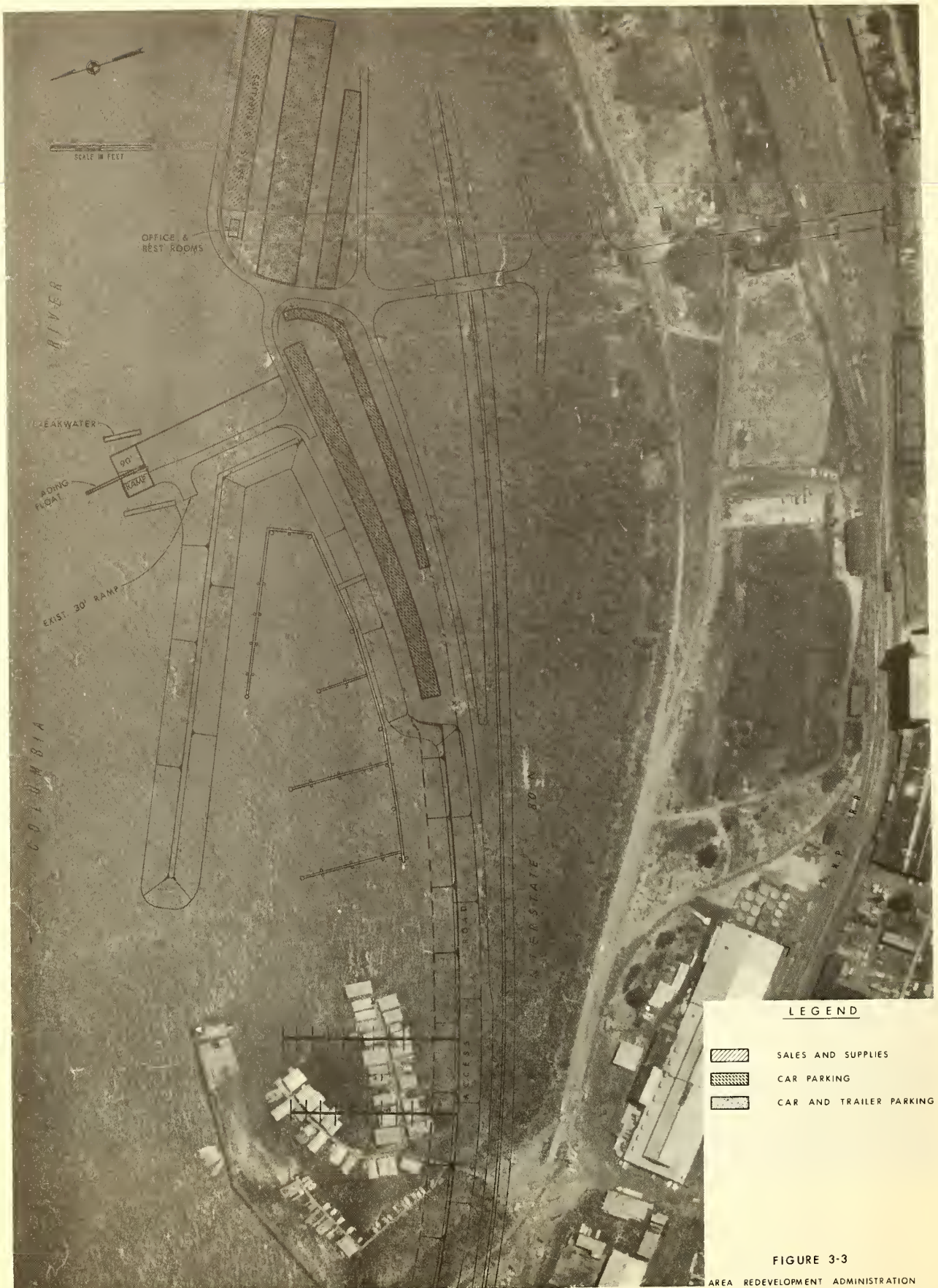


FIGURE 3-3  
 AREA REDEVELOPMENT ADMINISTRATION  
 SMALL BOAT HARBORS  
 AND RELATED MARINE FACILITIES STUDY  
 THE DALLES





# LEGEND




- |   |                         |
|---|-------------------------|
|  | SALES AND SUPPLIES      |
|  | CAR PARKING             |
|  | CAR AND TRAILER PARKING |

FIGURE 3-4  
 AREA REDEVELOPMENT ADMINISTRATION  
 SMALL BOAT HARBORS  
 AND RELATED MARINE FACILITIES STUDY  
 MOUTH OF THE DESCHUTES

## ESTIMATED OPERATING REVENUE AND EXPENSES

Table 17, which follows, shows the estimated operating revenue and expense items for the new facilities proposed for Hood River, Wasco, and Sherman Counties. These estimates are based on recent experience of somewhat larger marinas operating on the Oregon coast. The expectation is that operating and maintenance costs of the new facilities could be offset by income from rentals and concessions.

TABLE 17  
ESTIMATED 1975 REVENUES AND EXPENSES  
FROM NEW MARINA FACILITIES  
STUDY AREA 3  
HOOD RIVER, WASCO, AND SHERMAN COUNTIES

	<u>No. New Slips</u>	<u>Launch Ramps</u>	<u>Charter Service</u>	<u>Revenue Facility*</u>	<u>Charter</u>	<u>Expense</u>
Cascade Locks	52	1	No	\$ 3,692	---	\$ 3,432
Hood River	124	10	No	8,804	---	8,184
The Dalles	77	6	No	5,467	---	5,082
Mouth of the Deschutes	<u>52</u>	<u>1</u>	No	<u>3,692</u>	---	<u>3,432</u>
Total	305	18		\$21,655		\$20,130

-----  
\* Includes revenues from mooring, launching, parking, concession, rentals, etc.

### INDIRECT BENEFITS

The annual cost of an investment of \$1,020,000 in new small boat facilities in the three-county area is, at three percent and 50 years, \$39,700. As an offset against this cost may be placed the disbursements



from boat registration fees to the counties and from unrefunded gasoline tax collections. These could amount to \$4,500 and \$5,300, respectively, in 1963. Other indirect benefits will come to the area from employment in construction of the facilities and employment in connection with operation and maintenance of the new facilities. A rough estimate is:

Construction employment - man-days

$$\$880,000 \times 1/2 \times 1/49 = 9,000 \text{ man-days}$$

Operation and maintenance - man-days

$$\$880,000 \times .03 \times 1/45 = 594 \text{ man-days/year}$$

The intangibles are the benefits from increased vacationer and tourist traffic and stimulation of the small boat industry on a much wider than county basis. These, although practically impossible to measure, have a real value to the area.

## CONCLUSIONS

It is feasible to construct new facilities for recreational boating in Hood River and Sherman Counties at the following locations: Cascade Locks, Hood River, and the mouth of the Deschutes River. The location of new facilities in Wasco County at the The Dalles is possible, but not in the same region of feasibility as at the other three locations. Alternate locations for The Dalles expansion should be studied.

Priority for construction of small boat harbors and related marine facilities in Hood River, Wasco, and Sherman Counties should be assigned as follows:

1. Cascade Locks
2. Mouth of the Deschutes
3. Hood River
4. The Dalles



0 10 20 30 40  
MILES

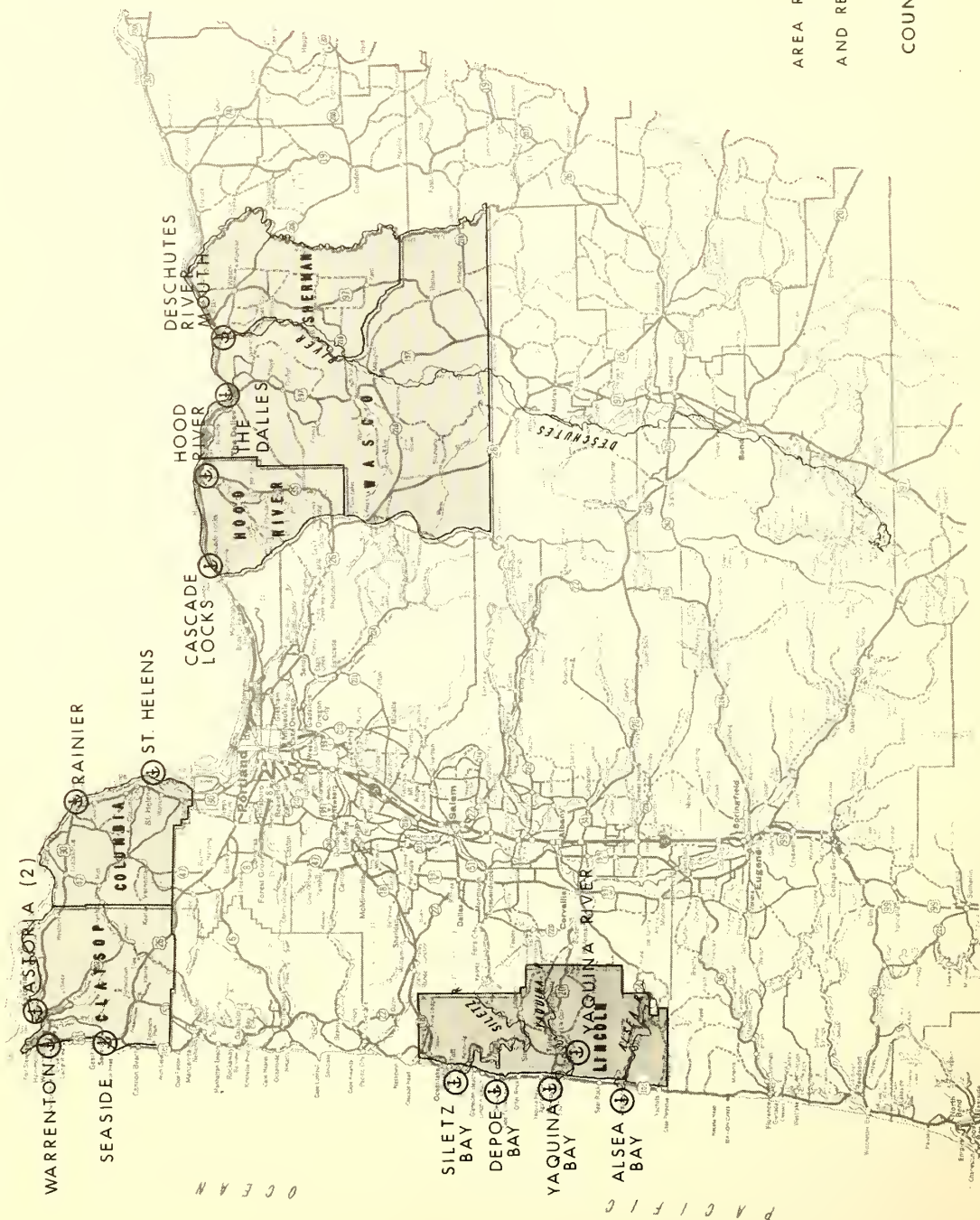
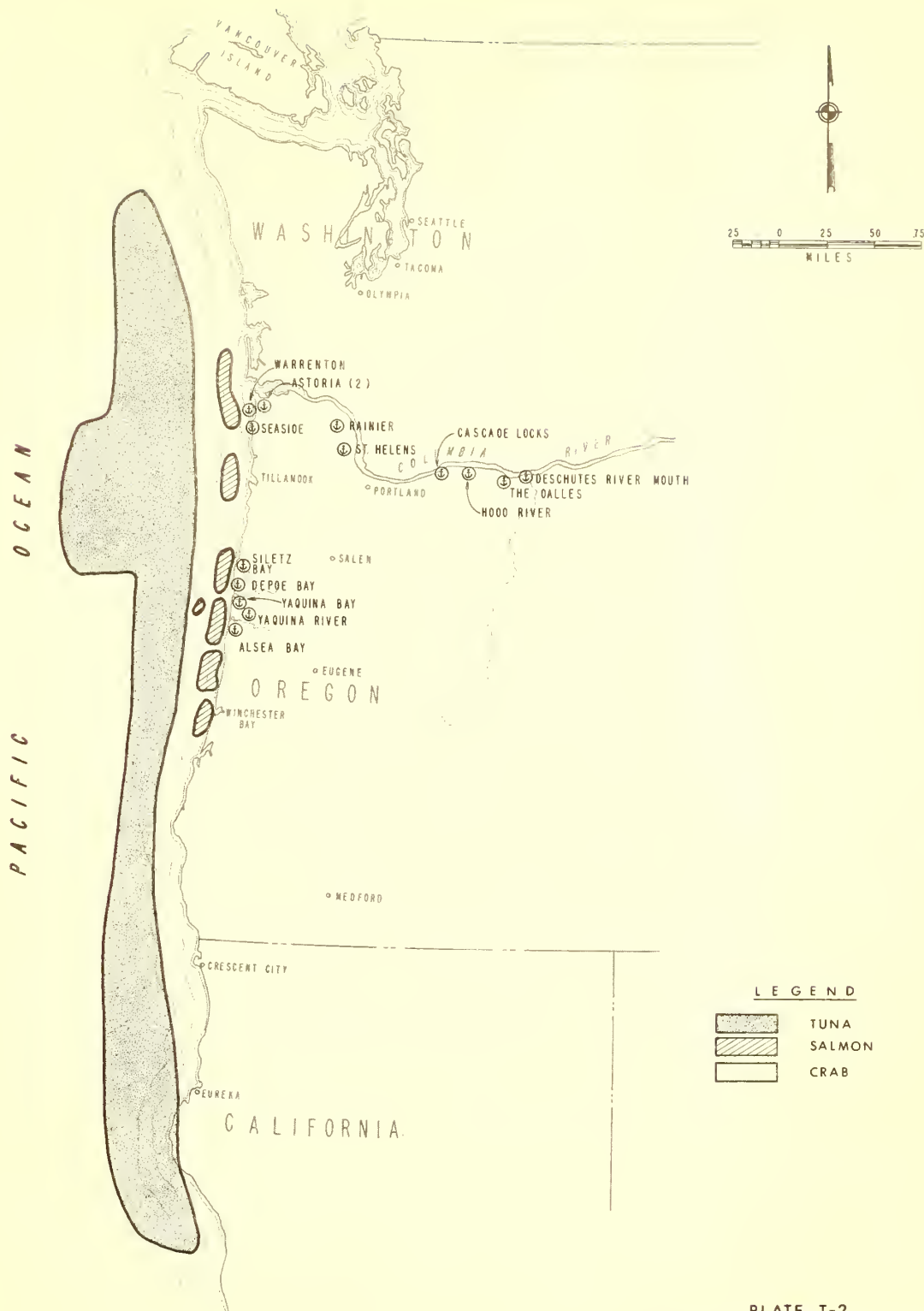


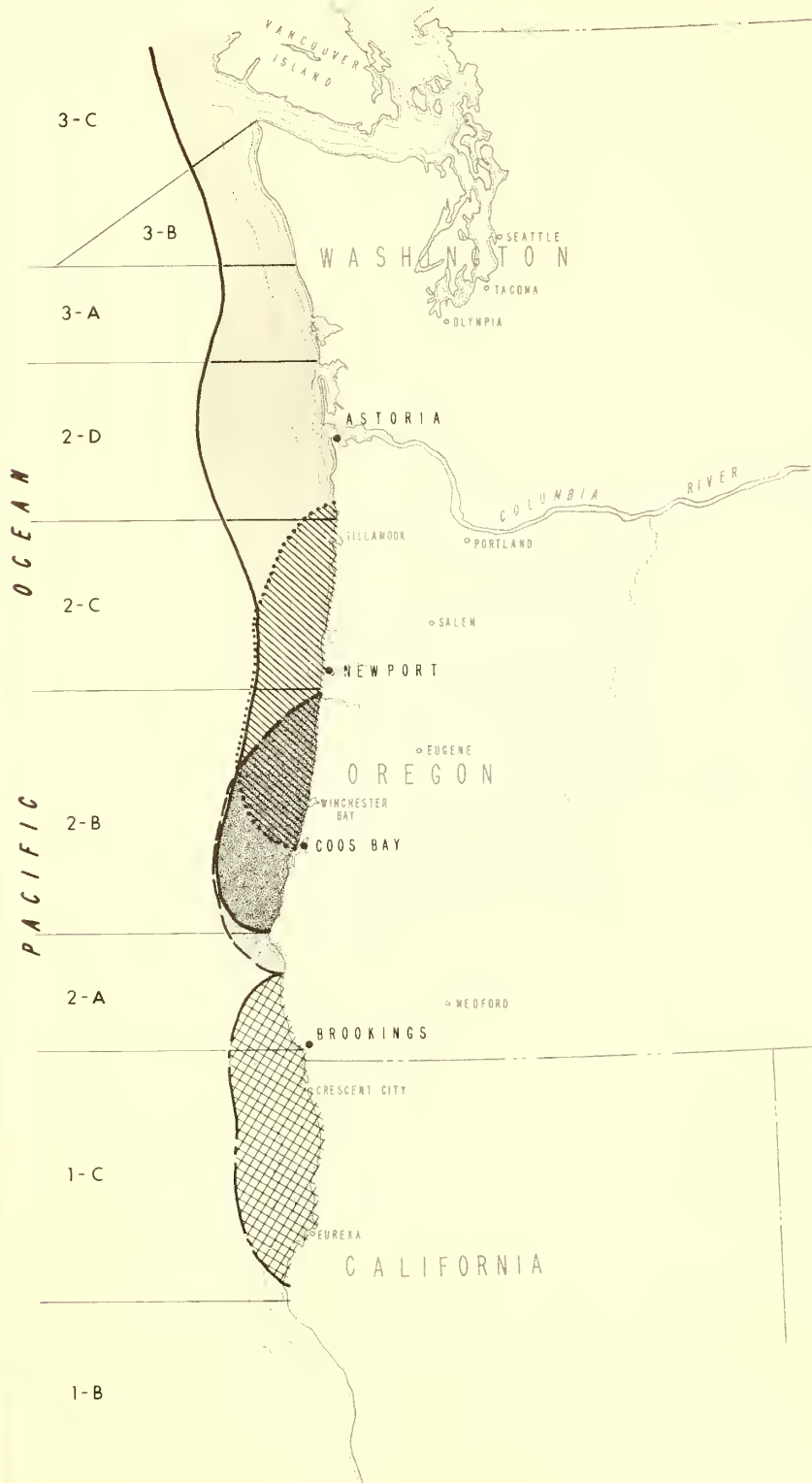
PLATE I-1

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY  
STATE OF OREGON  
COUNTIES AND GENERAL AREAS



# PLATE I-2

AREA REDEVELOPMENT ADMINISTRATION  
 SMALL BOAT HARBORS  
 AND RELATED MARINE FACILITIES STUDY  
 CRAB, SALMON & TUNA FISHERIES  
 IN VICINITY OF OREGON COAST



CATCH IN POUNDS AND EFFORT IN HOURS BY PMFC  
AREAS OF TRAWL LANDINGS IN OREGON  
AND ADJACENT AREAS

AREA	1959 LBS. (HRS.)	1960 LBS. (HRS.)	1961 LBS. (HRS.)	1962 LBS. (HRS.)
3-C	NONE REPORTED	224,000 ( 210 )	NONE REPORTED	19,500 (556 )
3-B	942,500 ( 830 )	920,000 (650 )	687,500 (835 )	373,500 (351 )
3-A	746,000 ( 460 )	1,224,000 (1200 )	734,500 (912 )	890,500 (953 )
2-D	9,500,500 (9350 )	10,903,500 (12750 )	11,689,500 (13944 )	17,025,000 (16531 )
2-C	3,886,500 (4170 )	5,354,000 (5840 )	6,251,000 (6178 )	7,093,000 (9248 )
2-B	7,786,500 (8220 )	6,789,500 (9210 )	5,998,000 (7508 )	6,015,500 (7692 )
2-A	NONE REPORTED	18,000 ( 40 )	37,500 ( 52 )	346,000 ( 362 )
1-C	NONE REPORTED	NONE REPORTED	NONE REPORTED	28,500 ( 64 )
1-B	NONE REPORTED	NONE REPORTED	NONE REPORTED	NONE REPORTED

LEGEND

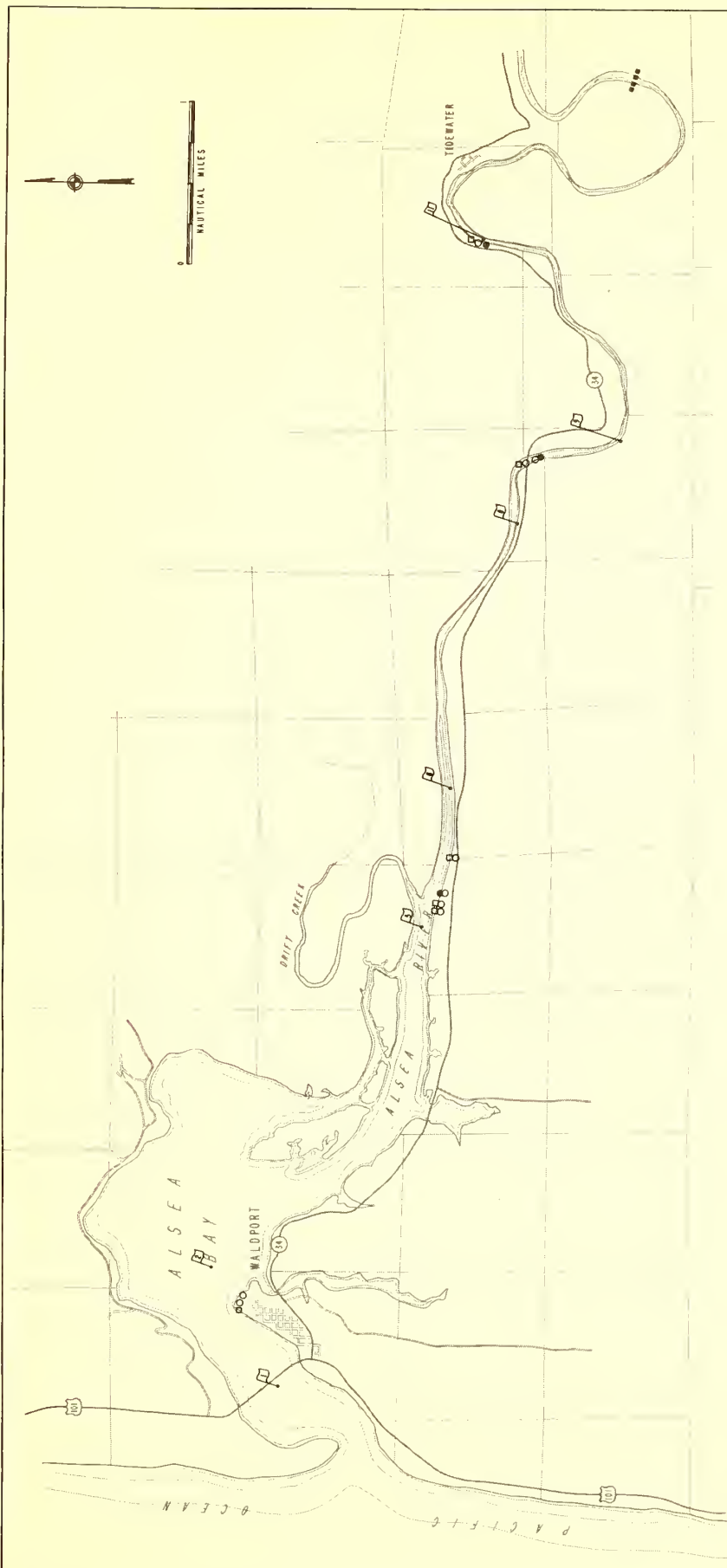
	ASTORIA BOATS
	NEWPORT BOATS
	COOS BAY BOATS
	BROOKINGS BOATS

PLATE I-3

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY  
OPERATING AREAS & CATCH OF OREGON  
AND ADJACENT FISHING FLEETS

NOTE:  
SOURCE OF INFORMATION - OREGON  
STATE FISH COMMISSION

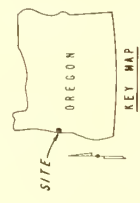


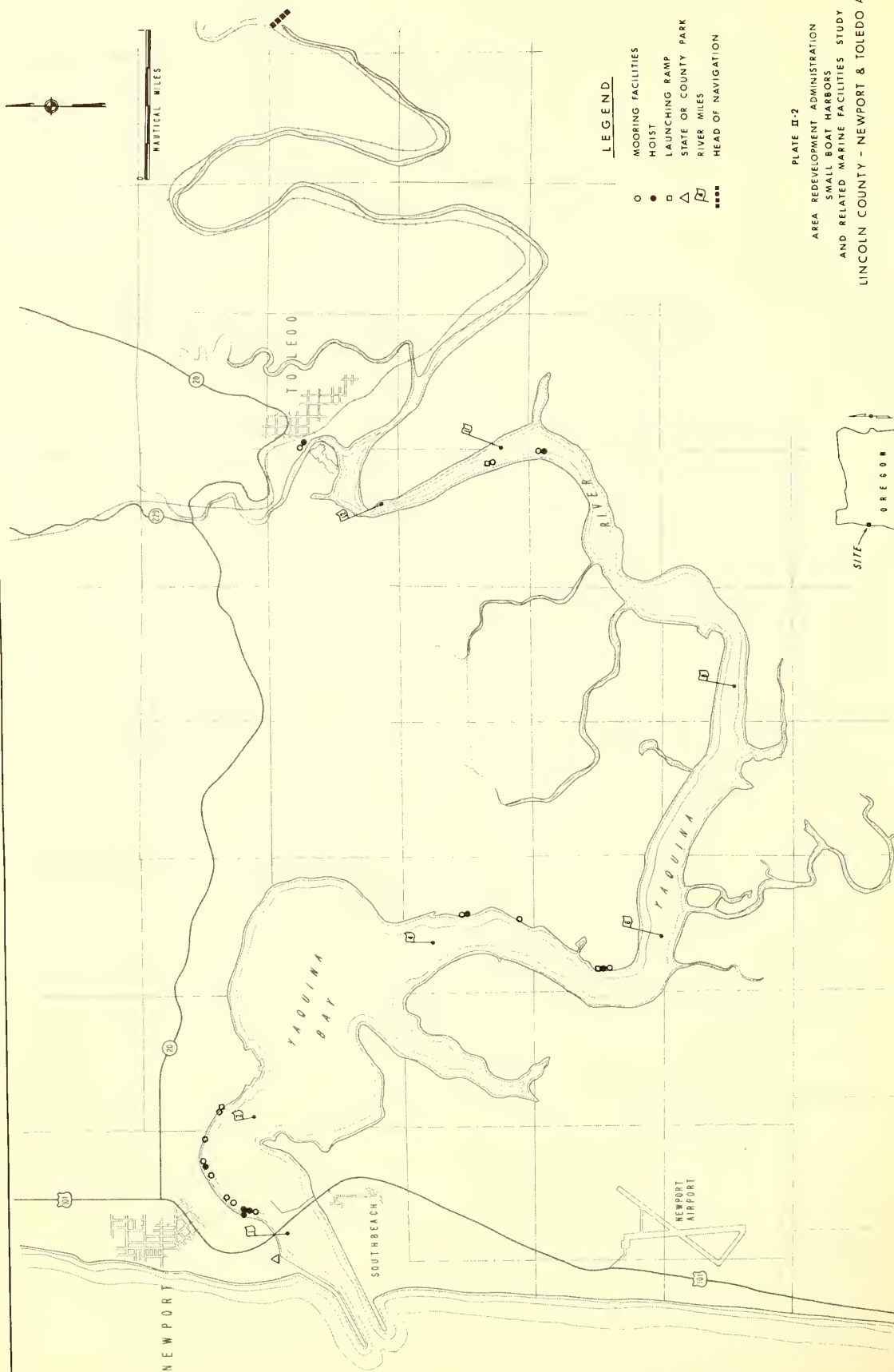


**LEGEND**

- MOORING FACILITIES
- HOIST
- LAUNCHING RAMP
- △ STATE OR COUNTY PARK
- RIVER MILES
- HEAD OF NAVIGATION

PLATE II-1  
 AREA REDEVELOPMENT ADMINISTRATION  
 SMALL BOAT HARBORS  
 AND RELATED MARINE FACILITIES STUDY  
 LINCOLN COUNTY - ALSEA AREA



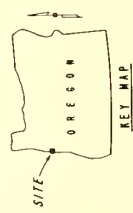


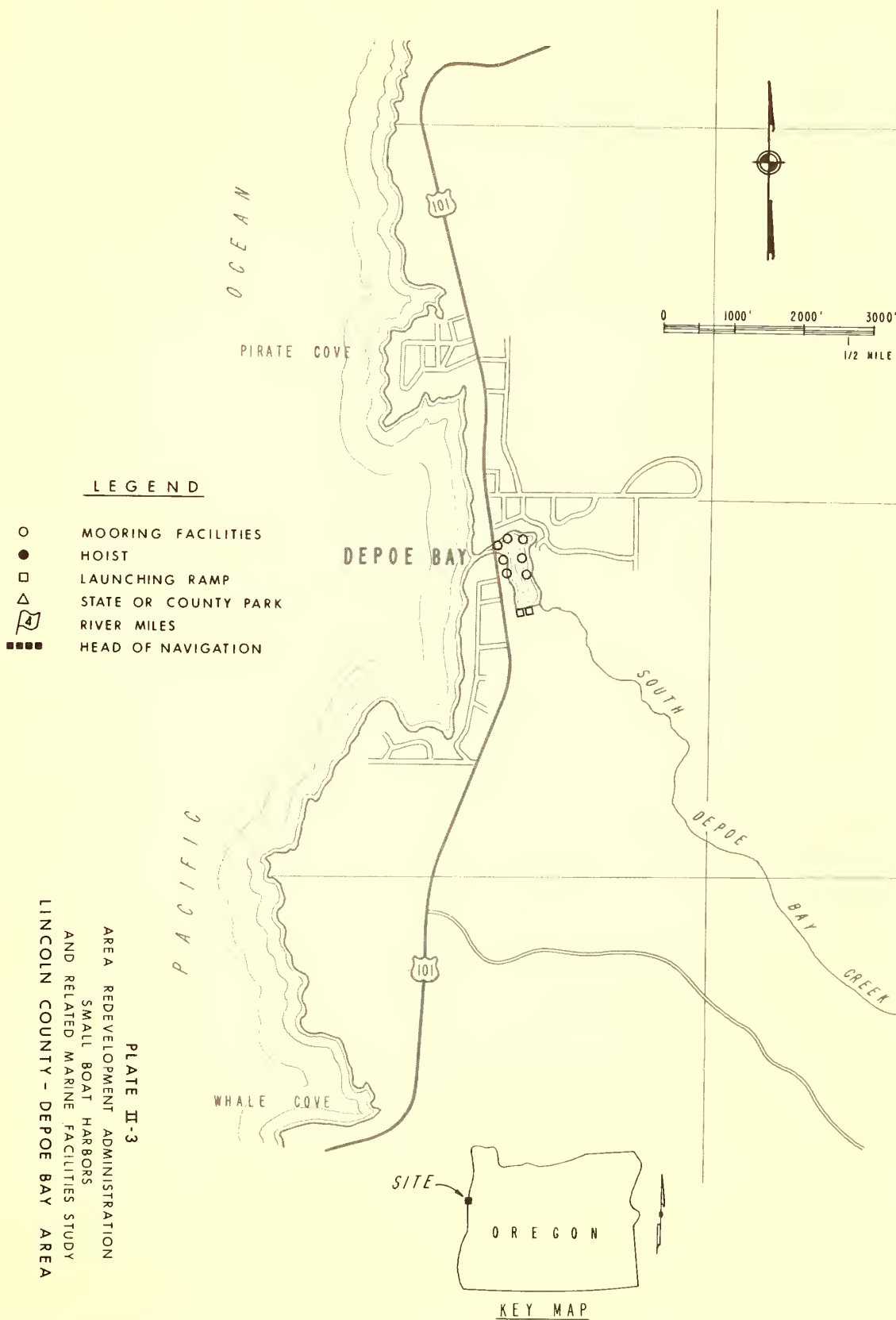
NAUTICAL MILES

**LEGEND**

- MOORING FACILITIES
- HOIST
- LAUNCHING RAMP
- △ STATE OR COUNTY PARK
- ⊥ RIVER MILES
- ⊥ HEAD OF NAVIGATION

PLATE II-2  
 AREA REDEVELOPMENT ADMINISTRATION  
 SMALL BOAT HARBORS  
 AND RELATED MARINE FACILITIES STUDY  
 LINCOLN COUNTY - NEWPORT & TOLEDO AREA







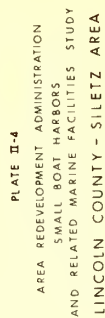
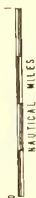
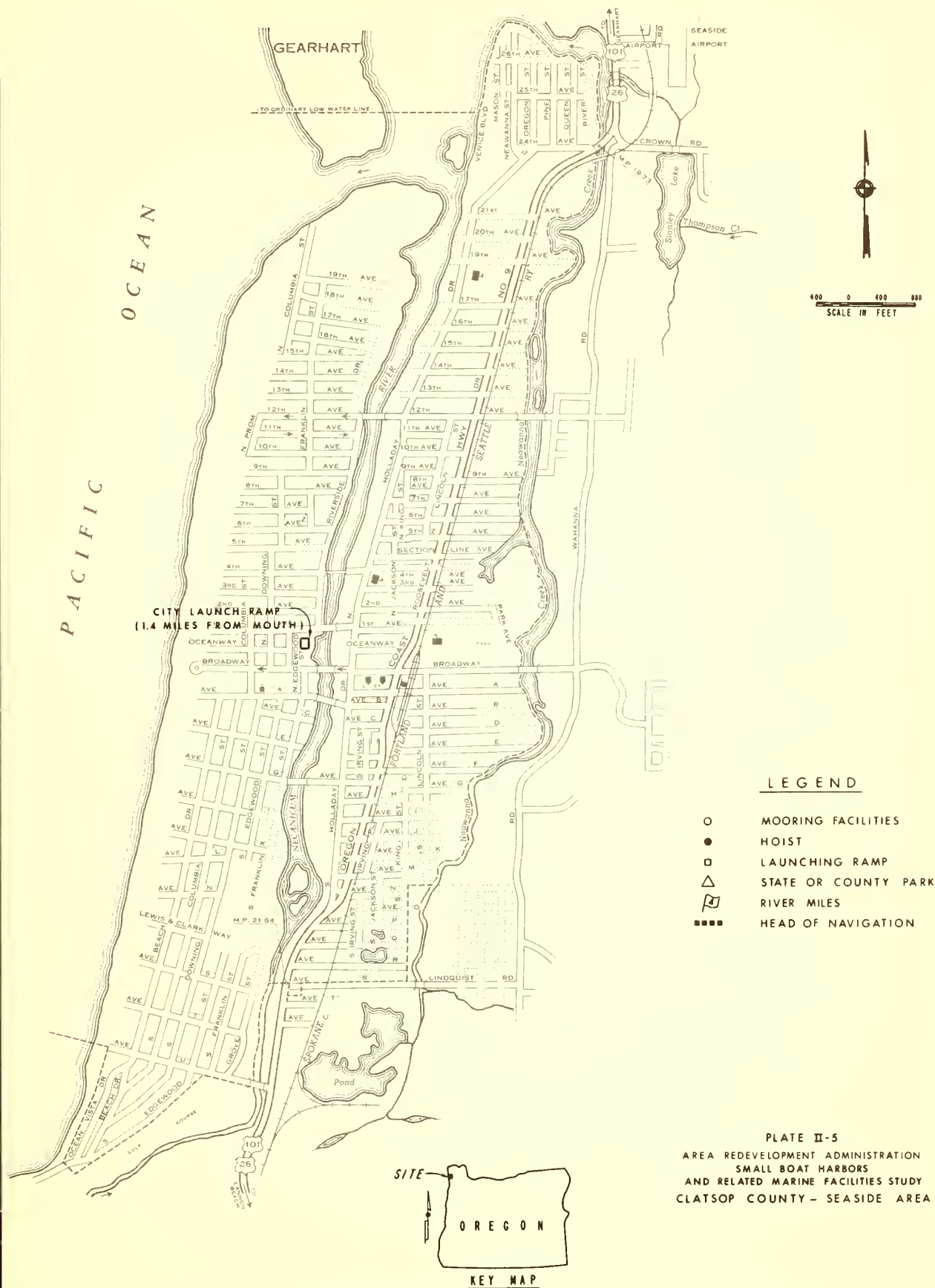


PLATE II-4

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY  
LINCOLN COUNTY - SILETZ AREA





# PLATE II-6

AREA REDEVELOPMENT ADMINISTRATION  
 SMALL BOAT HARBORS  
 AND RELATED MARINE FACILITIES STUDY  
 CLATSOP COUNTY - WARRENTON, ASTORIA AREA

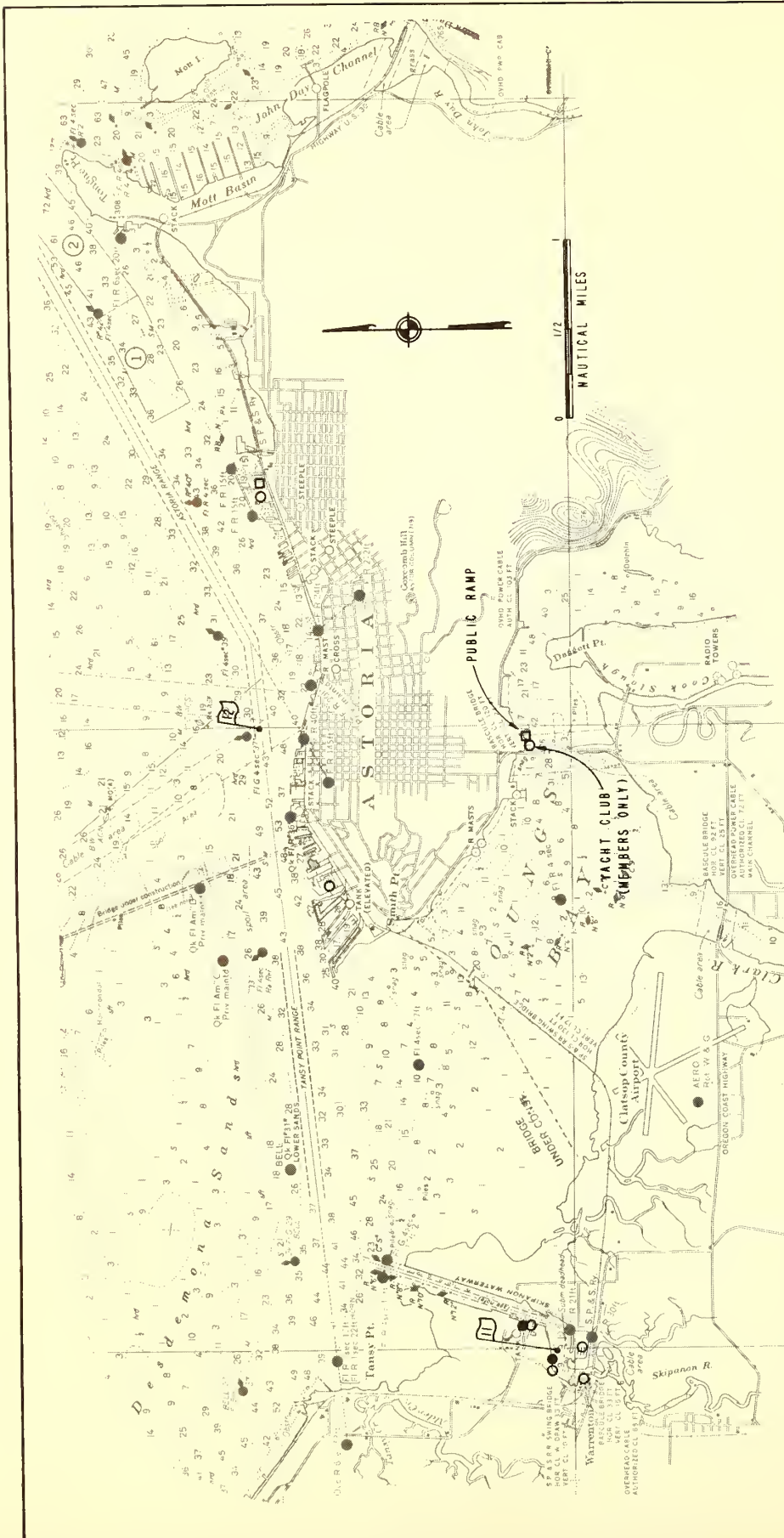
SITE

OREGON

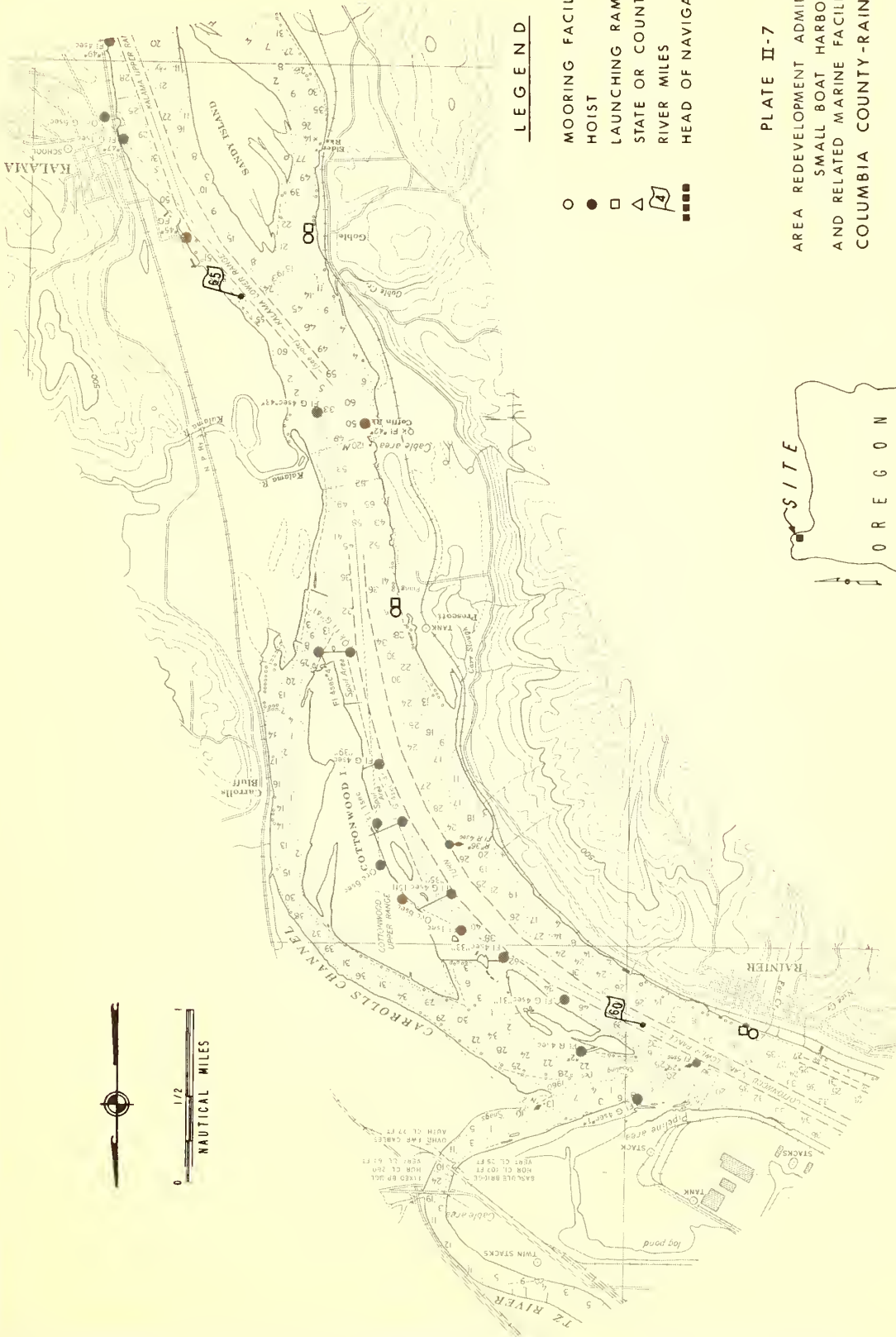
KEY MAP

## LEGEND

- MOORING FACILITIES
- HOIST
- LAUNCHING RAMP
- △ STATE OR COUNTY PARK
- ▢ RIVER MILES
- ▨ HEAD OF NAVIGATION





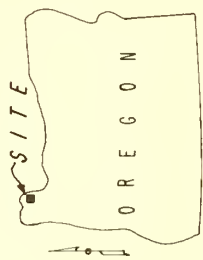


# LEGEND

- MOORING FACILITIES
- HOIST
- LAUNCHING RAMP
- △ STATE OR COUNTY PARK
- ▴ RIVER MILES
- ▴ HEAD OF NAVIGATION

## PLATE II-7

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY  
COLUMBIA COUNTY-RAINIER AREA



## KEY MAP







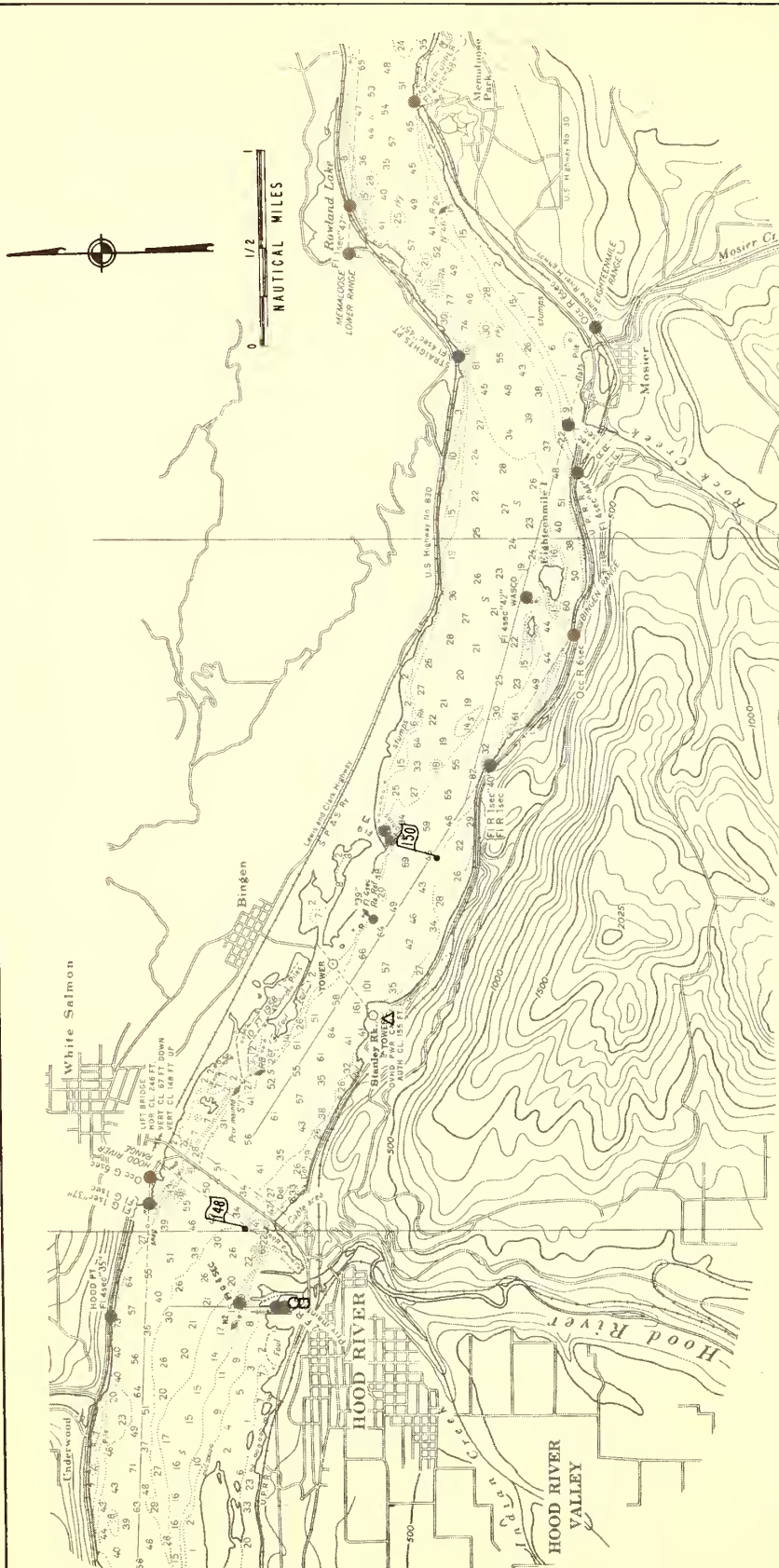
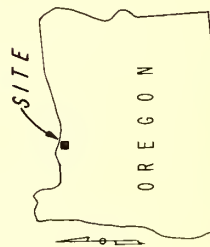


PLATE II-10

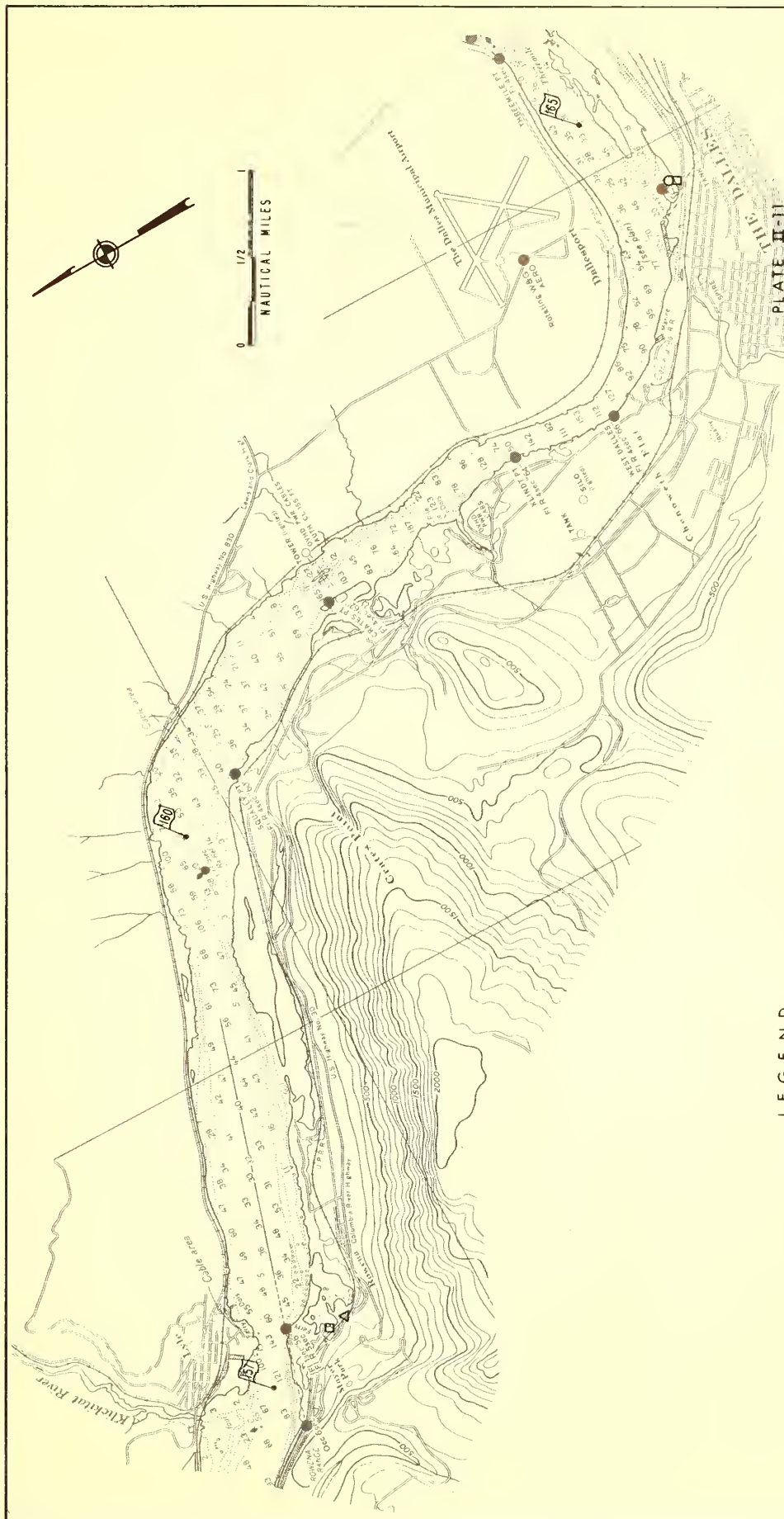
AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY  
HOOD RIVER COUNTY-HOOD RIVER AREA

LEGEND

- MOORING FACILITIES
- HOIST
- LAUNCHING RAMP
- △ STATE OR COUNTY PARK
- RIVER MILES
- HEAD OF NAVIGATION



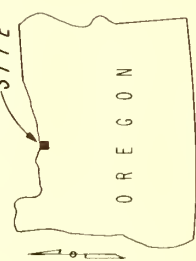
KEY MAP



# LEGEND

- MOORING FACILITIES
- HOIST
- LAUNCHING RAMP
- △ STATE OR COUNTY PARK
- R RIVER MILES
- HEAD OF NAVIGATION

SITE



KEY MAP

AREA REDEVELOPMENT ADMINISTRATION  
SMALL BOAT HARBORS  
AND RELATED MARINE FACILITIES STUDY  
WASCO COUNTY - THE DALLES AREA





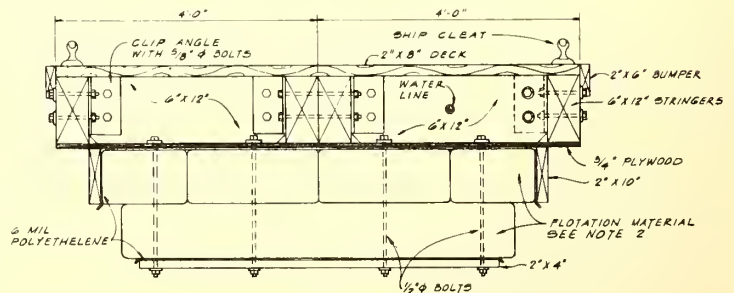
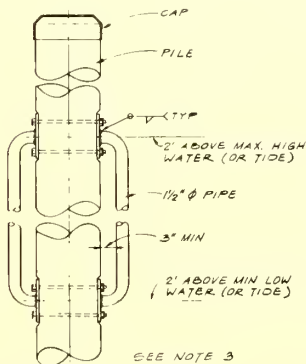
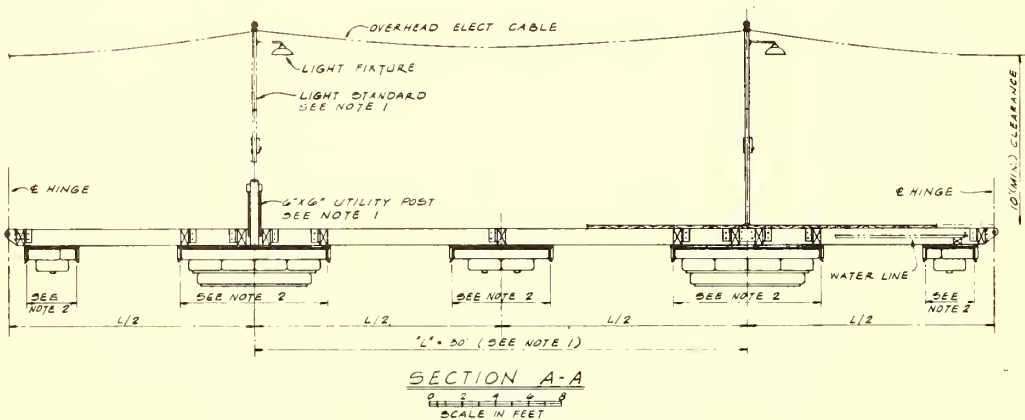
TABLE IV - 1

## FORECAST OF POPULATION &amp; PLEASURE BOAT REGISTRATION - OREGON ECONOMIC AREAS &amp; COUNTIES (1960 TO 1980)

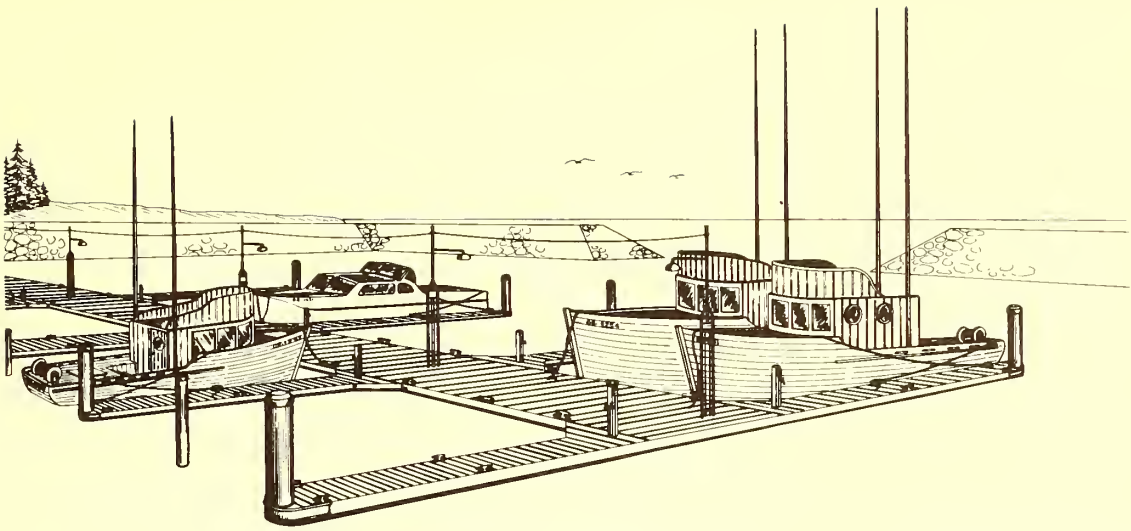
ECONOMIC AREAS AND COUNTIES	1965			1970		1975		1980	
	1960 POPULATION*	POPULATION *	PLEASURE BOATS	POPULATION *	PLEASURE BOATS	POPULATION*	PLEASURE BOATS	POPULATION *	PLEASURE BOATS
STATE	1,768,687	1,903,671	52,429	2,058,822	64,361	2,193,077	79,382	2,342,852	101,503
AREA 1a									
CLATSOP	27,380	25,444	609	25,108	707	24,718	835	24,384	1,042
COLUMBIA	22,379	22,859	811	23,472	903	24,025	1,001	24,754	1,125
LINCOLN	24,635	27,460	1,056	30,698	1,243	34,331	1,473	38,610	1,755
TILLAMOOK	18,955	19,285	790	19,845	841	20,393	894	21,012	955
AREA 1b									
COOS	54,955	58,248	2,223	61,241	2,469	66,259	2,832	72,024	3,274
CURRY	13,983	19,544	940	26,709	1,260	28,268	1,309	29,801	1,355
DOUGLAS	68,458	71,166	2,112	74,444	2,498	79,039	3,052	84,198	3,827
JACKSON	73,962	78,178	2,474	82,597	2,908	88,064	3,495	94,173	4,281
JOSEPHINE	29,917	29,689	914	29,508	1,018	29,490	1,156	29,584	1,345
AREA 2									
BENTON	39,165	44,446	1,154	50,451	1,529	56,609	2,059	63,452	2,884
HOOD RIVER	13,395	13,464	119	13,644	141	13,725	172	13,821	217
LINN	58,867	60,417	1,831	62,731	2,148	64,915	2,516	66,965	3,044
MARION	120,888	132,533	3,297	146,893	4,283	162,306	5,735	179,171	7,963
POLK	26,523	26,928	524	27,688	631	28,234	780	28,557	992
YAMHILL	32,478	31,725	752	31,382	872	30,693	1,030	29,817	1,253
AREA 3									
GILLIAM	3,061	2,983	45	2,900	51	2,756	58	2,854	72
MORROW	4,871	4,796	133	4,762	156	4,615	173	4,495	204
SHERMAN	2,446	2,518	51	2,624	63	2,673	79	2,739	101
UMATILLA	44,352	44,541	891	45,120	1,057	44,683	1,266	44,320	1,583
WASCO	20,205	22,638	455	25,585	606	28,281	813	31,402	1,134
AREA 4									
BAKER	17,295	18,068	492	18,907	595	19,734	734	20,819	946
CROOK	9,430	9,561	248	9,726	295	9,829	357	9,940	452
DESCHUTES	23,100	23,867	966	24,728	1,039	25,508	1,114	26,459	1,203
GRANT	7,726	7,289	199	6,909	217	6,507	242	6,140	279
HARNEY	6,744	6,944	141	7,172	171	7,396	213	7,700	279
JEFFERSON	7,130	7,980	327	8,919	378	9,944	436	11,200	509
KLAMATH	47,475	50,115	1,500	53,060	1,793	55,747	2,161	58,799	2,673
LAKE	7,158	7,471	65	7,830	80	8,187	101	8,660	135
MALHEUR	22,764	22,231	550	21,799	632	21,260	743	20,839	918
UNION	18,180	18,777	494	19,546	598	20,159	738	20,879	949
WALLOWA	7,102	6,998	200	6,909	225	6,797	258	6,740	306
WHEELER	2,722	2,472	53	2,253	57	2,028	61	1,820	69
AREA A									
CLACKAMAS	113,038	128,356	3,949	143,314	4,925	154,099	5,996	164,639	7,484
MULTNOMAH (PORTLAND) (OUT-CO.)	522,813	558,662	13,693	599,554	17,229	629,995	21,875	666,311	29,224
WASHINGTON	92,237	112,212	2,244	133,673	3,160	153,818	4,395	176,018	6,309
AREA B									
LANE	162,890	183,806	6,127	207,121	7,587	227,992	9,230	249,956	11,362

\* FROM OREGON STATE BOARD OF CENSUS, BULLETIN P-10, JULY 1, 1963, FORECAST FOR JULY 1 OF THE YEAR.

APPENDIX-IV

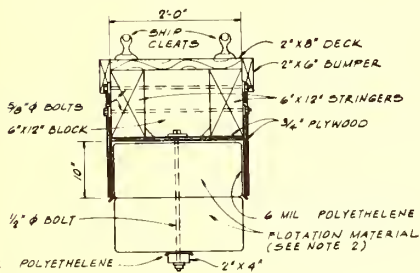
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SCALE V FEET



### SECTION C-C

0 1 2  
SCALE IN FEET

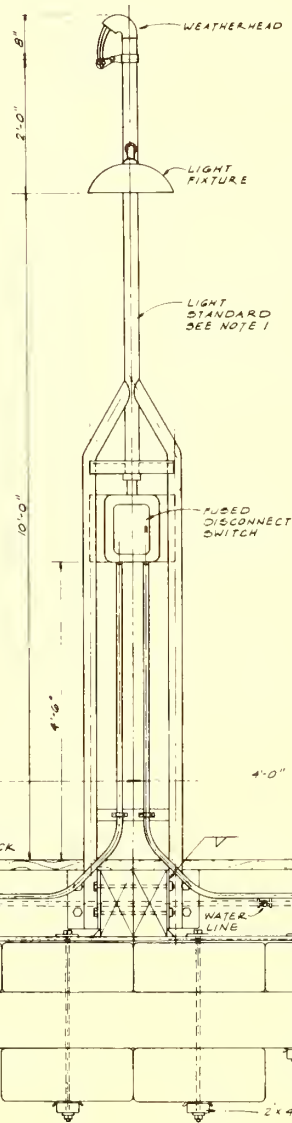


### SECTION D-D

0 1 2  
SCALE IN FEET

#### NOTES

1. THE FLOAT UNIT, AS SHOWN, PROVIDES SLIP SPACE FOR EIGHT 21' TO 25' FOOT BOATS. DIMENSIONS "L" AND "F" AND SPACING OF LIGHT STANDARDS AND UTILITY OUTLETS MAY BE ADJUSTED FOR SIZE OF BOATS TO BE MOORED.
2. THE QUANTITY AND LOCATION OF POLYSTYRENE LOGS, STYROFOAM, UNDER MAIN FLOAT AND FINGER FLOATS MAY BE ADJUSTED TO BALANCE THE DIFFERENT FINGER FLOAT SPACINGS.
3. PILES SHALL BE DOUGLAS FIR AND SHALL BE SIZED AND DRIVEN TO PROVIDE ADEQUATE ANCHORAGE, AS REQUIRED BY SITE CONDITIONS AND FLOAT UNIT SIZE. WOOD PILE SHALL BE TREATED IN ACCORDANCE WITH AMERICAN WOOD PRESERVATION ASSOCIATION (AWPA) SPECIFICATION C3.
4. TIMBERS AND WOODWORK SHALL BE DOUGLAS FIR SIZED AS SHOWN AND TREATED IN ACCORDANCE WITH (AWPA) SPECIFICATION C2. PLYWOOD SHALL BE EXTERIOR GRADE PLATFORM GRADE AND SHALL BE TREATED IN ACCORDANCE WITH (AWPA) SPECIFICATION C4. ALL TIMBERS, WOODWORK, AND PLYWOOD SHALL BE CUT AND DRILLED BEFORE TREATMENT.
5. MISCELLANEOUS METAL AND HARDWARE SHALL BE GALVANIZED. ALL METAL COMPONENTS SHALL BE FABRICATED (INCLUDING ALL DRILLING AND BENDING) BEFORE HOT-DIP GALVANIZING.
6. ALL ELECTRICAL MATERIALS AND WORK SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND APPLICABLE LOCAL CODES.



### SECTION B-B

0 1 2  
SCALE IN FEET

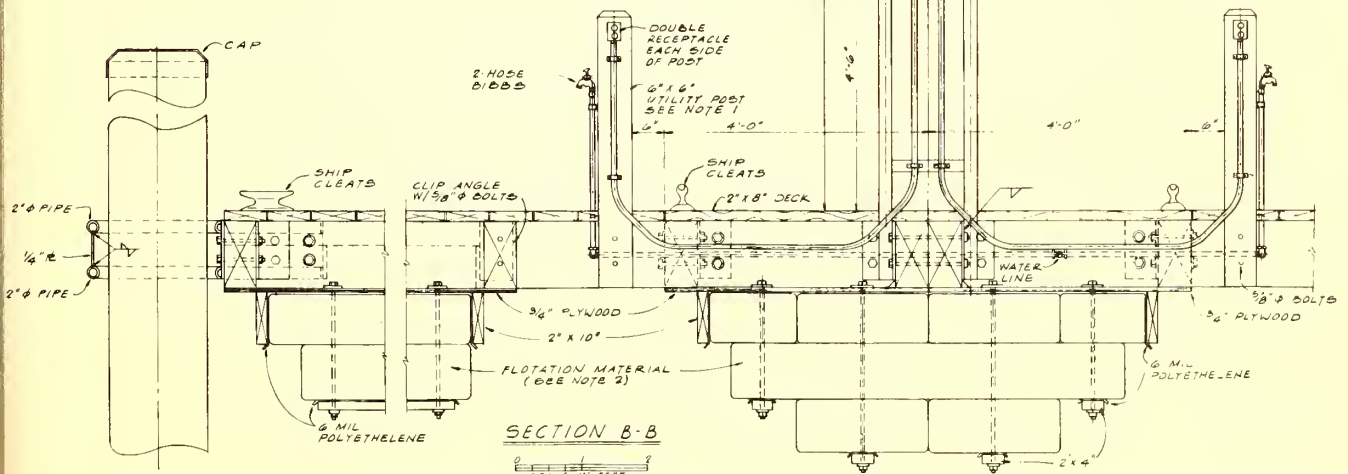






TABLE V-1

ARA BOAT FACILITIES  
ALSEA HARBOR - WALDPORT

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1.	Mob. and Demob.		ls		\$ 20,000.00
2.	Site Preparation		ls		5,000.00
3.	Dredging				
	Excavation	180,815	cy	0.45	81,366.75
	Embankment	111,750	cy	0.45	50,287.50
4.	Gravel Bank Protection	7,645	cy	5.00	38,225.00
5.	Riprap	2,824	cy	6.00	16,944.00
6.	Crushed Rock Surfacing				
	Car & Trailer Parking(6")	10,667	sy	1.00	10,667.00
	Car Parking (6")	2,245	sy	1.00	2,245.00
	Sales & Supplies (4")	4,950	sy	0.70	3,465.00
7.	Launching Ramp Lanes	6	ea	3000.00	18,000.00
	Approach Paving	555	sy	3.80	2,109.00
8.	Floats and Docks	1,000	lf	60.00	60,000.00
9.	Loading Floats	230	lf	40.00	9,200.00
10.	Shear Boom	740	lf	30.00	22,200.00
11.	Paved Roads (50' wide)	1,717	lf	10.20	34,683.40
12.	Office & Toilet Facilities		ls		11,000.00
13.	Parking Area Markers		ls		1,807.68
14.	Utilities		ls		<u>5,000.00</u>
	Subtotal				\$ 392,200.33
	Engineering and contingencies ( 20%)				<u>78,440.00</u>
	TOTAL				<u><u>\$470,640.33</u></u>

TABLE V-2

ARA BOAT FACILITIES  
NEWPORT  
YAQUINA BAY

No.	Description	Quan.	Unit	Unit Cost	Total Cost	
1.	Mob. and Demob.		ls		\$ 20,000.00	
2.	Site Preparation		ls		5,000.00	
3.	Dredging					
	Excavation	397,330	cy			
	Embankment	922,530	cy	0.45	415,138.50	
4.	Gravel Bank Protection	10,527	cy	5.00	52,635.00	
5.	Riprap	8,838	cy	6.00	53,028.00	
6.	Crushed Rock Surfacing					
	Car & Trailer Parking					
	(6")	25,967	sy	1.00	25,967.00	
	Car Parking	(6")	27,228	sy	1.00	27,228.00
	Sales & Supplies	(4")	14,511	sy	0.70	10,157.70
7.	Launching Ramp Lanes	14	ea	3,000.00	42,000.00	
	Approach Paving	1,168	sy	3.80	4,438.40	
8.	Floats and Docks	4,280	lf	60.00	256,800.00	
9.	Loading Floats	480	lf	40.00	19,200.00	
10.	Shear Boom	none	lf			
11.	Paved Roads 50'	4,300	lf	10.20	43,860.00	
	Paved Roads 40'	1,900	lf	9.00	17,100.00	
12.	Office and Toilet Facilities		ls		11,000.00	
13.	Parking Area Markers		ls		7,450.00	
14.	Utilities		ls		8,000.00	
	Subtotal				\$1,019,002.60	
	Engineering and Contingencies (20%)				203,800.00	
	TOTAL				<u>\$1,222,802.00</u>	



TABLE V-3

ARA BOAT FACILITIES  
TOLEDO - YAQUINA RIVER

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1.	Mob. and Demob.		ls		\$ 5,000
2.	Site Preparation		ls		5,000
3.	Dredging				
	Excavation	17,780	cy		
	Embankment	65,560	cy	0.45	29,502
4.	Gravel Bank Protection	1,840	cy	5.00	9,200
5.	Riprap	5,515	cy	6.00	33,090
6.	Crushed Rock Surfacing				
	Car & Trailer Park. (6")	4,000	sy	1.00	4,000
	Car Parking (6")	5,600	sy	1.00	5,600
	Sales & Supplies (4")	2,280	sy	0.70	1,596
7.	Launching Ramp Lanes	2	ea	3,000.00	6,000
	Approach Paving	170	sy	3.80	646
8.	Floats and Docks	450	lf	60.00	27,000
9.	Loading Floats	230	lf	40.00	9,200
10.	Shear Boom	730	lf	30.00	21,900
11.	Paved Roads (50' wide)	1,200	lf	10.20	12,240
12.	Office and Toilet Facilities		ls		11,000
13.	Parking Area Markers		ls		1,350
14.	Utilities		ls		<u>8,000</u>
	Subtotal				\$190,324
	Engineering and Contingencies (20%)				<u>38,065</u>
	TOTAL				<u>\$228,389</u>

TABLE V-4

ARA BOAT FACILITIES  
DEPOE BAY

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1.	Mob. and Demob.		ls		\$ 10,000 00
2.	Site Preparation		ls		5,000.00
3.	Dredging				
	Basin Excavation	50,000	cy	1.45	72,500.00
	Cut and Fill	20,000	cy	0.35	7,000.00
4.	Gravel Bank Protection	800	cy	5.00	4,000.00
5.	Riprap	2,400	cy	6.00	14,400.00
6.	Crushed Rock Surfacing				
	Car & Trailer Park. (6")	4,450	sy	1.00	4,450.00
	Car Parking (6")	1,060	sy	1.00	1,060.00
	Sales & Supplies (4")	466	sy	.70	327.30
7.	Launching Ramp Lanes	4	ea	3,000.00	12,000.00
	Approach Paving	361	sy	3.80	1,371.80
8.	Floats and Docks	810	lf	60.00	48,600.00
9.	Loading Floats	185	lf	30.00	5,550.00
10.	Paved Roads (24' wide)	750	lf	9.00	6,750.00
11.	Office and Toilet Facilities		ls		11,000.00
12.	Parking Area Markers		ls		2,000.00
13.	Utilities		ls		<u>3,000.00</u>
	Subtotal				\$209,009.10
	Engineering and Contingencies (20%)				<u>41,801.82</u>
	TOTAL				<u><u>\$250,810.92</u></u>

TABLE V-5

ARA BOAT FACILITIES  
SILETZ BAY

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1.	Mob. and Demob.		ls		\$ 20,000.00
2.	Site Preparation		ls		5,000.00
3.	Dredging				
	Excavation	273,677	cy		
	Embankment	176,500	cy	0.45	79,425.00
4.	Gravel Bank Protection	7,930	cy	5.00	39,650.00
5.	Riprap	10,700	cy	6.00	64,200.00
6.	Crushed Rock Surfacing				
	Car & Trailer Park. (6'')	2,660	sy	1.00	2,660.00
	Car Parking (6'')	3,660	sy	1.00	3,660.00
	Sales & Supplies (4'')	9,820	sy	0.70	6,874.00
	Access Roads (6'')	3,335	sy	1.00	3,335.00
7.	Launching Ramp Lanes	2	ea	3,000.00	6,000.00
	Approach Paving	139	sy	3.80	528.20
8.	Floats and Docks	960	lf	60.00	57,600.00
9.	Loading Floats	180	lf	40.00	7,200.00
10.	Shear Boom	None	lf		
11.	Paved Roads (50' wide)	2,300	lf	10.20	23,460.00
12.	Office and Toilet Facilities		ls		11,000.00
13.	Parking Area Markers		ls		900.00
14.	Utilities		ls		<u>4,000.00</u>
	Subtotal				\$335,492.20
	Engineering and Contingencies (20%)				<u>67,098.00</u>
	TOTAL				<u><u>\$402,590.00</u></u>



TABLE V-6

ARA BOAT FACILITIES  
SEASIDE

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1.	Mob. and Demob.		ls		\$ 60,000
2.	Site Preparation		ls		5,000
3.	Jetty Rock	360,000	cy	10.80	3,888,000
4.	Dredged Fill	580,000	cy	0.45	261,000
5.	Gravel Bank Protection	10,100	cy	5.00	50,500
6.	Utilities		ls		10,000
7.	Crushed Rock Surfacing				
	Car & Trailer Park. (6")	23,000	sy	1.00	23,000
	Car Parking (6")	28,600	sy	1.00	28,600
	Sales and Supplies (4")	14,900	sy	0.70	10,430
8.	Launching Ramp		ls		40,000
9.	Floats and Docks	1,820	lf	60.00	109,200
10.	Loading Floats	450	lf	40.00	18,000
11.	Paved Roads (50')	6,600	lf	9.60	63,360
12.	Office and Toilet Facilities		ls		25,000
13.	Parking Area Markers	875	ea	8.50	<u>7,428</u>
	Subtotal				\$4,599,518
	Engineering and Contingencies (20%)				<u>919,903</u>
	TOTAL				<u><u>\$5,519,421</u></u>

TABLE V-7

ARA BOAT FACILITIES  
WARRENTON

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1.	Mob. and Demob.		ls		\$ 10,000.00
2.	Site Preparation		ls		4,000.00
3.	Dredging				
	Embankment	41,850	cy	0.45	18,832.50
	Dragline				
	Embankment	1,170	cy	0.90	1,053.00
4.	Gravel Bank Protection	770	cy	5.00	3,850.00
5.	Riprap	2,310	cy	6.00	13,860.00
6.	Crushed Rock Surfacing				
	Car & Trailer Park.(6")	24,450	sy	1.00	24,450.00
	Car Parking (6")	9,467	sy	1.00	9,467.00
	Sales & Supplies (4")	8,078	sy	0.70	5,654.60
7.	Launching Ramp Lanes	13	ea	3,000.00	39,000.00
	Approach Paving	1,083	sy	3.80	4,115.40
8.	Loading Floats	190	lf	40.00	7,600.00
9.	Floats and Docks	580	lf	60.00	34,800.00
10.	Shear Boom	None	lf		
11.	Paved Roads (40')	460	lf	9.00	4,140.00
12.	Office and Toilet Facilities		ls		11,000.00
13.	Parking Area Markers		ls		4,750.00
14.	Utilities		ls		<u>4,000.00</u>
	Subtotal				\$200,572.50
	Engineering and Contingencies (20%)				<u>40,114.00</u>
	TOTAL				<u><u>\$240,686.00</u></u>

TABLE V-8

ARA BOAT FACILITIES  
ASTORIA

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1.	Mob. and Demob.		ls		\$ 5,000.00
2.	Site Preparation		ls		1,000.00
3.	Dredging Excavation	209,380	cy	0.45	94,221.00
4.	Crushed Rock Surfacing				
	Car & Trailer Park. (6")	1,111	sy	1.00	1,111.00
	Car Parking (6")	2,290	sy	1.00	2,290.00
	Sales & Supplies (4")	32,666	sy	0.70	22,866.20
5.	Launching Ramp Lar	1	ea	3,000.00	3,000.00
	Approach Paving	780	sy	3.80	2,964.00
6.	Floats and Docks	5,190	lf	60.00	311,400.00
7.	Loading Floats	75	lf	40.00	3,000.00
8.	Paved Roads (50')	300	lf	10.20	3,060.00
9.	Office & Toilet Facilities		ls		11,000.00
10.	Parking Area & Markers		ls		500.00
11.	Utilities		ls		<u>1,000.00</u>
	Subtotal				\$462,412.20
	Engineering and Contingencies (20%)				<u>92,482.00</u>
	TOTAL				<u><u>\$554,894.00</u></u>

TABLE V- 9

ARA BOAT FACILITIES  
RAINIER

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1.	Mob. and Demob.		ls		\$ 2,000.00
2.	Site Preparation		ls		2,000.00
3.	Min. Grading (No Excavation or Embankment)		ls		2,000.00
4.	Crushed Rock Surfacing				
	Car & Trailer Park. ( 6'')	3,933	sy	1.00	3,933.00
	Car Parking (6'')	4,944	sy	1.00	4,944.00
	Sales & Supplies (4'')	311	sy	0.70	217.70
5.	Launching Ramp				
	Lanes	3	ea	3,000.00	9,000.00
	Approach Paving	250	sy	3.80	950.00
6.	Floats & Docks	450	lf	60.00	27,000.00
7.	Loading Floats	150	lf	40.00	6,000.00
8.	Shear Boom	800	lf	30.00	24,000.00
9.	Paved Roads ( 50')	65	lf	10.20	663.00
	( 30')	230	lf	7.80	1,794.00
10.	Office & Toilet Facilities		ls		6,000.00
11.	Parking Area Markers		ls		1,250.00
12.	Utilities		ls		<u>2,000.00</u>
	Subtotal				\$ 93,751.70
	Engineering and Contingencies ( 20%)				<u>18,750.00</u>
	TOTAL				<u><u>\$112,502.00</u></u>



TABLE V-10

ARA BOAT FACILITIES  
ST. HELENS

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1.	Mob. and Demob.		ls		\$ 4,000
2.	Site Preparation		ls		2,000
3.	Dredging Excavation and Embankment	107,000	cy	0.70	74,900
4.	Gravel Bank Protections				
5.	Riprap, Used Alone	2,860	cy	5.00	14,300
6.	Crushed Rock Surfacing Car and Trailer Park. (6")	4,700	sy	1.00	4,700
7.	Launching Ramp Lanes	6	ea	3,000.00	18,000
8.	Floats	1,600	lf	60.00	96,000
9.	Piers	300	lf	50.00	15,000
10.	Shear Boom	2,300	lf	5.00	11,500
11.	Paved Roads and Areas	16,630	sy	1.75	29,000
12.	Office & Toilet Facilities		ls		9,000
13.	Parking Area Markers		ls		5,200
14.	Utilities		ls		5,000
15.	Bulkhead	550	lf	17.00	<u>9,400</u>
	Subtotal				\$298,000
	Engineering and Contingencies (20%)				<u>59,600</u>
	TOTAL				<u><u>\$357,600</u></u>

TABLE V-11

ARA BOAT FACILITIES  
CASCADE LOCKS

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1	Mob. and Demob.		ls		\$ 1,500.00
2.	Site Preparation		ls		2,000.00
3.	Dredging				
	Excavation	0	cy		
	Embankment	0	cy		
4.	Crushed Rock Surfacing				
	Car & Trailer Park. (6")	1,510	sy	1.00	1,510.00
	Car Parking (6")	1,645	sy	1.00	1,645.00
	Sales & Supplies (4")	1,890	sy	0.70	1,323.00
5.	Launching Ramp, Lane	1	ea	3,000.00	3,000.00
	Approach Paving	84	sy	3.80	319.20
6.	Floats and Docks	440	lf	60.00	26,400.00
7.	Loading Floats	0	lf		
8.	Shear Boom	0	lf		
9.	Paved Roads (30' Wide)	860	lf	7.80	6,708.00
	Paved Roads (40' Wide)	290	lf	9.00	2,610.00
10.	Office & Toilet Facilities		ls		11,000.00
11.	Parking Area Markers		ls		450.00
12.	Utilities		ls		<u>6,000.00</u>
	Subtotal				\$64,465.20
	Engineering and Contingencies (20%)				<u>12,893.00</u>
	TOTAL				<u><u>\$77,358.00</u></u>

TABLE V -12

ARA BOAT FACILITIES  
HOOD RIVER

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1.	Mob. and Demob.		ls		\$ 2,000
2.	Site Preparation		ls		1,000
3.	Crushed Rock Surfacing				
	Car & Trailer Park. (6'')	10,660	sy	1.00	10,660
	Car Parking (6'')	3,310	sy	1.00	3,310
	Sales and Supplies (4'')	2,170	sy	0.70	1,519
4.	Launching Ramp Lanes	10	ea	3,000.00	30,000
5.	Floats and Docks	900	lf	60.00	54,000
6.	Loading Floats	200	lf	40.00	8,000
7.	Paved Roads	4,200	lf	10.00	42,000
8.	Office & Toilet Facilities		ls		16,000
9.	Parking Area Markers	388	ea	8.50	<u>3,298</u>
	Subtotal				\$171,787
	Engineering and Contingencies (20%)				<u>34,357</u>
	TOTAL				<u><u>\$206,144</u></u>

TABLE V -13

ARA BOAT FACILITIES  
THE DALLES

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1.	Mob. and Demob.		ls		\$ 10,000
2.	Site Preparation		ls		5,000
3.	Rock Fill (for road)	25,000	cy	5.00	125,000
4.	Parking Fill	30,000	cy	4.50	135,000
5.	Crushed Rock Surfacing				
	Car & Trailer Park. (6")	11,300	sy	1.00	11,300
	Car Parking (6")	9,150	sy	1.00	9,150
	Sales and Supplies (4")	2,000	sy	.70	1,400
6.	Launching Ramp Lanes	6	ea	3,000.00	18,000
7.	Floats and Piers	580	lf	60.00	34,800
8.	Loading Floats	100	lf	30.00	3,000
9.	Paved Roads (40')	18,000	lf	9.00	162,000
10.	Office & Toilet Facilities		ls		11,000
11.	Parking Markers		ls		3,000
12.	Utilities		ls		<u>5,000</u>
	Subtotal				\$533,650
	Engineering and Contingencies (20%)				<u>106,730</u>
	TOTAL				<u><u>\$640,380</u></u>



TABLE V-14

ARA BOAT FACILITIES  
DESCHUTES RIVER MOUTH

No.	Description	Quan.	Unit	Unit Cost	Total Cost
1.	Mob. and Demob.		ls		\$ 1,500.00
2.	Site Preparation		ls		2,000.00
3.	Dredging				
	Excavation	0	cy		
	Embankment	0	cy		
4.	Gravel Bank Protection	0	cy		
5.	Riprap	0	cy		
6.	Crushed Rock Surfacing				
	Car & Trailer Park. (6")	1,111	sy	1.00	1,111.00
	Car Parking (6")	1,111	sy	1.00	1,111.00
	Sales & Supplies (4")	7,777	sy	0.70	5,443.90
7.	Launching Ramp Lane	1	ea	3,000.00	3,000.00
	Approach Paving	84	sy	3.80	319.20
8.	Floats and Docks	480	lf	60.00	28,800.00
9.	Paved Roads (50' wide)	1,491	lf	10.20	15,208.20
10.	Office and Toilet Facilities		ls		11,000.00
11.	Parking Area Markers		ls		300.00
12.	Utilities		ls		<u>8,000.00</u>
	Subtotal				\$77,793.30
	Engineering and Contingencies (20%)				<u>15,559.00</u>
	TOTAL				<u><u>\$93,352.00</u></u>









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